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Version 1.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This device is in conformity with the following EC/EMC directives:

- ❑ **EN 55022** Limits and methods of mesurement of radio disturbance characteristics of information technology equipment
- ❑ **EN 61000-3-2** Disturbances in supply systems caused
- ❑ **EN 61000-3-3** Disturbances in supply systems caused by household appliances and similar electrical equipment " Voltage fluctuations"
- ❑ **EN 55024** Information technology equipment-Immunity characteristics-Limits and methods of measurement
- ❑ **EN 60950** Safety for information technology equipment including electrical business equipment
- ❑ **CE marking** CE

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilieur du Canada.

About the Manual

The manual consists of the following:

Chapter 1 **Introducing the Motherboard**	Describes features of the motherboard.	⇨ page 1
Chapter 2 **Installing the Motherboard**	Describes installation of motherboard components.	⇨ page 7
Chapter 3 **Using BIOS**	Provides information on using the BIOS Setup Utility.	⇨ page 29
Chapter 4 **Using the Motherboard Software**	Describes the motherboard software.	⇨ page 65
Chapter 5 **Intel® Matrix Storage Manager RAID Configurations**	Describes Intel® Matrix Storage Manager RAID Configurations.	⇨ page 69
Chapter 6 **AMD CrossFireX™ Technology Support**	Describes AMD Crossfire™ Technology	⇨ page 75
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Chapter 1
Introducing the Motherboard

Introduction

Thank you for choosing the **Z97-PK** motherboard. This motherboard is a high performance, enhanced function motherboard designed to support the LGA1150 socket for Intel® 4th and 5th Generation Core™ Family processors.

This motherboard is based on Intel® Z97 Express Chipset for best desktop platform solution. It supports up to 32 GB of system memory with dual channel DDR3 1600/ 1333 MHz. One PCI Express x16 Gen3 slot (Gray slot) and one PCI Express x16 Gen2 slot (Black slot runs at x4 mode) are supported, intended for Graphics Interface. In addition, one PCI Express x1 Gen2 slot is for extending usage.

It integrates USB 2.0 and USB 3.0 interface, supporting up to ten USB 2.0 ports (four USB 2.0 ports at rear panel and three USB 2.0 headers support additional six USB 2.0 ports) and four USB 3.0 ports (two USB 3.0 ports at the rear panel and one USB 3.0 header supports additional two USB 3.0 ports). The gray USB 2.0 header provides EZ charger technology, please refer to Front Panel USB 2.0 headers of chapter 2 for more details.

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including one PS/2 mouse and keyboard Combo connector, one VGA port, one DVI port, one HDMI port, one RJ45 LAN connector, four USB 2.0 ports, two USB 3.0 ports and audio 8-ch jacks.

In addition, this motherboard supports six SATA 6Gb/s connectors for expansion.

Package Contents

Your motherboard package ships with the following items:

- ❑ Z97-PK Motherboard
- ❑ Quick Installation Guide
- ❑ User Manual
- ❑ DVD
- ❑ I/O Shield
- ❑ 2 SATA 6G Cables

The package contents above are for reference only, please take the actual package items as standard.

Specifications

CPU	• LGA1150 socket for Intel® 4th and 5th Generation Core™ Family processors • Supports CPU up to 84W, TDP up to 95W • Supports Intel® Turbo Boost Technology • Supports Intel® Hyper-Threading Technology • Supports Intel® 64 Architecture • Supports Intel® Advanced Vector Extensions 2.0 • Supports Intel® Responsiveness Technologies - Intel® Rapid Storage Technology 12 - Intel® Smart Response Technology* - Intel® Rapid Start Technology* *Note: Please go to ECS website for the latest CPU support list.* **SSDS, multiple HDDs required.*
Chipset	• Intel® Z97 Chipset
Memory	• Dual-channel DDR3 memory architecture • 4 x 240-pin DDR3 DIMM sockets support up to 32 GB • Supports DDR3 1600/1333 MHz SDRAM *Note: Please go to ECS website for the latest Memory support list.*
Expansion Slots	• 2 x PCI Express x16 slots (one PCI Express Gen3 x16 slot & one PCI Express Gen2 x4 mode slot) • 1 x PCI Express x1 Gen2 slot
AMD CrossFireX™ Technology	• Supports AMD CrossFireX™ Technology - The PCIEX16_S1 (black color of PCIE x16 slot) supports PCI Express Gen2 running at X4 mode
Storage	• Supported by Intel® Z97 Express Chipset - 6 x Serial ATA 6Gb/s devices - RAID 0, RAID 1, RAID 5, RAID 10 configuration
Audio	• Realtek ALC892 8-Ch High Definition audio CODEC - Compliant with HD audio specification
LAN	• Realtek RTL8111G Gigabit Lan
Rear Panel I/O	• 1 x PS/2 mouse & keyboard Combo connector • 1 x D-sub (VGA port) • 1 x DVI port • 1 x HDMI port • 4 x USB 2.0 ports • 1 x RJ45 LAN connector • 2 x USB 3.0 ports • 1 x Audio 8-ch jacks
Internal I/O Connectors & Headers	• 1 x 24-pin ATX Power Supply connector • 1 x 4-pin ATX 12V Power connector • 1 x 4-pin CPU_FAN connector • 1 x 4-pin PWR_FAN connector • 1 x 4-pin SYS_FAN connector • 1 x USB 3.0 header supports additional two USB 3.0 ports

	• 3 x USB 2.0 headers support additional six USB 2.0 ports (Gray header supports EZ charger) • 6 x SATA 6Gb/s connectors • 1 x SPDIF out header • 1 x Front Panel audio header • 1 x Front Panel switch/LED header • 1 x CIR header • 1 x COM header • 1 x CLR_CMOS jumper • 1 x Parallel port header (LPT) • 1 x Trusted platform module header (TPM) • 1 x Speaker header • 1 x Case open header • 1 x ME_UNLOCK header
System BIOS	• AMI BIOS with 64Mb SPI Flash ROM • Supports Plug and Play, STR (S3)/ STD(S4), Hardware Monitor • Audio, LAN, can be disabled in BIOS • F7 hot key for boot up devices option • Supports ACPI & DMI • Supports PgUp clear CMOS Hotkey (Has PS2 KB Model only) • Supports 3 Independent Dispaly • Supports Multi-Language • Supports AC'97/HD Audio auto detect (default)
AP Support	• Supports eBLU*1/eDLU/eSF*1/Cyberlink*2/Norton*2/Muzee*2/EZ Charger *Note: *1Microsoft .NET Framework 3.5 is required.* **2Free bundle software including ECS DVD: Cyberlink/Norton/ Muzee.*
Form Factor	• Micro ATX Size, 244mm x 220mm

Motherboard Components

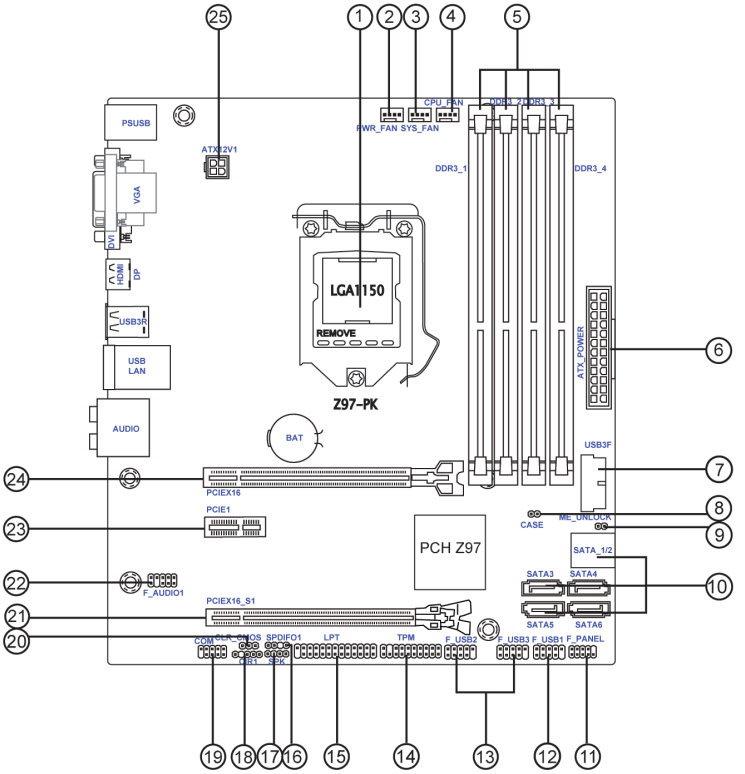
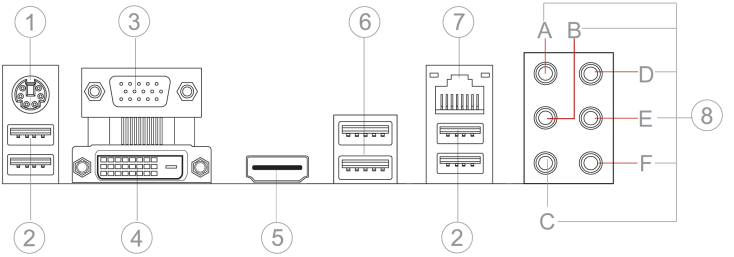


Table of Motherboard Components

LABEL	COMPONENTS
1. CPU Socket	LGA1150 socket for Intel® 4th and 5th Generation Core™ Family processors
2. PWR_FAN	4-pin power cooling fan connector
3. SYS_FAN	4-pin system cooling fan connector
4. CPU_FAN	4-pin CPU cooling fan connector
5. DDR3_1~4	240-pin DDR3 Module slots
6. ATX_POWER	Standard 24-pin ATX power connector
7. USB3F	Front panel USB 3.0 header
8. CASE	CASE open header
9. ME_UNLOCK	ME unlock header-for factory use only
10. SATA1~6	Serial ATA 6Gb/s connectors
11. F_PANEL	Front panel switch/LED header
12. F_USB1	Front panel USB 2.0 header (Gray header supports EZ Charger)
13. F_USB2~3	Front panel USB 2.0 headers
14. TPM	Trusted platform module header
15. LPT	Parallel port header
16. SPDIFO1	SPDIF out header
17. SPK	Speaker header
18. CIR1	Consumer Infrared
19. COM	Onboard serial port header
20. CLR_CMOS	Clear CMOS jumper
21. PCIEX16_S1	PCI Express Gen2 x4 slot
22. F_AUDIO1	Front panel audio header
23. PCIE1	PCI Express Gen2 x1 slot
24. PCIEX16	PCI Express Gen3 x16 slot for graphics interface
25. ATX12V	4-pin +12V power connector

I/O Ports



1. PS/2 Combo port
Use the PS/2 combo port to connect the PS/2 Keyboard or PS/2 Mouse.

2. USB 2.0 Ports
Use the USB 2.0 ports to connect USB 2.0 devices.

3. VGA Port
Connect your monitor to the VGA port.

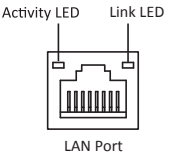
4. DVI Port
Connect your monitor to the DVI port.

5. HDMI Port
You can connect the display device to the HDMI port.

6. USB 3.0 Ports
Use the USB 3.0 ports to connect USB 3.0 devices.

7. LAN Port
Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

LAN LED	Status	Description
Activity LED	OFF	No data
	Orange blinking	Active
Link LED	OFF	No link
	Green	Link



8. Audio Ports
Use the audio jacks to connect audio devices. The D port is for stereo line-in signal, while the F port is for microphone in signal. This motherboard supports 8-channel audio devices that correspond to the A, B, C, and E port respectively. In addition, all of the 3 ports, B, C, and E provide users with both right & left channels individually. Users please refer to the following note for specific port function definition.

A: Center & Woofer	D: Line-in
B: Back Surround	E: Front Out
C: Side Surround	F: Mic_in Rear

The above port definition can be changed to audio input or audio output by changing the driver utility setting.

Chapter 2
Installing the Motherboard

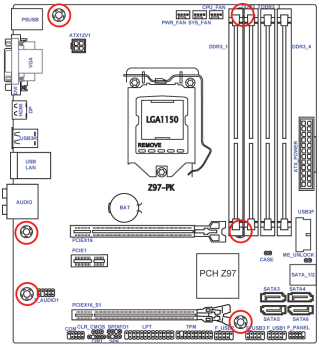
2-1. Safety Precautions

Follow these safety precautions when installing the motherboard:

- Wear a grounding strap attached to a grounded device to avoid damage from static electricity.
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard.
- Leave components in the static-proof bags.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.

2-2. Installing the motherboard in a Chassis

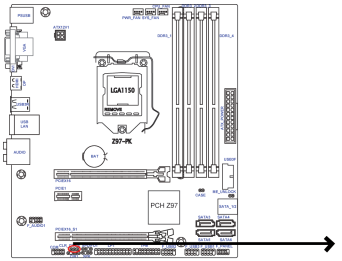
This motherboard carries a Micro ATX form factor of 244 x 220 mm. Choose a chassis that accommodates this from factor. Make sure that the I/O template in the chassis matches the I/O ports installed on the rear edge of the motherboard. Most system chassis have mounting brackets installed in the chassis, which corresponds to the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.

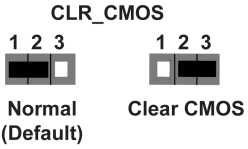


Do not over-tighten the screws as this can stress the motherboard.

2-3. Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.





To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to "Load Default Settings" and then "Save and Exit Setup".

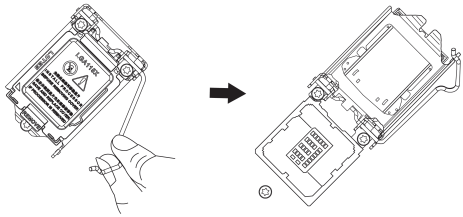
2-4. Installing Hardware

2-4-1. Installing the Processor

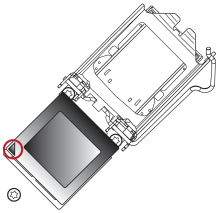
- This motherboard has an LGA1150 socket.
- When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.
- You may be able to change the settings in the system Setup Utility. We strongly recommend you do not over-clock processor or other components to run faster than their rated speed.
- The following illustration shows CPU installation components.

A. Press the hook of lever down with your thumb and pull it to the right side to release it from retention tab.

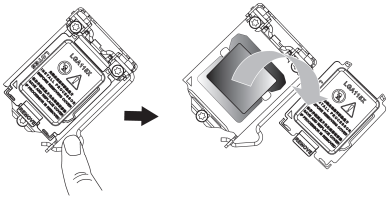
B. Lift the tail of the load lever and rotate the load plate to fully open position.



C. Grasp the edge of the package substrate. Make sure pin 1 indicator is on your bottom-left side. Aim at the socket and place the package carefully into the socket by purely vertical motion.



D. Rotate the load plate onto the package IHS (Intergraded Heat Spreader). Engage the load lever while pressing down lightly onto the load plate. Secure the load lever with the hook under retention tab. Then the cover will flick automatically.

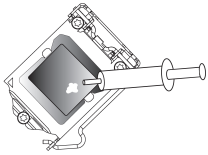


Please save and replace the cover onto the CPU socket if processor is removed.

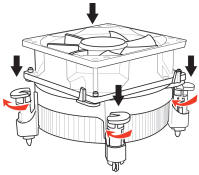
2-4-2. Installing the CPU Cooler

- Install the cooling fan in a well-lit work area so that you can clearly see the motherboard and processor socket.
- Avoid using cooling fans with sharp edges in case the fan casing and the clips cause serious damage to the motherboard or its components.
- To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heat sink installation procedures may vary with the type of CPU fan/heatsink supplied. The form and size of fan/heatsink may also vary.
- DO NOT remove the CPU cap from the socket before installing a CPU.
- Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1150 socket.
- The following illustration shows how to install CPU fan.

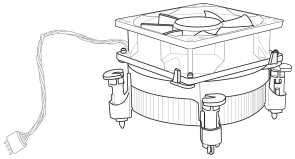
A. Apply some thermal grease onto the contacted area between the heatsink and the CPU, and make it to be a thin layer.



B. Fasten the cooling fan supporting base onto the CPU socket on the motherboard. And make sure the CPU fan is plugged to the CPU fan connector.



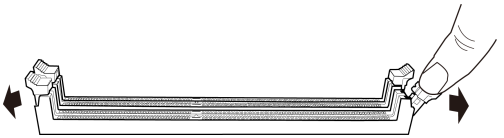
C. Connect the CPU cooler power connector to the CPU_FAN connector.



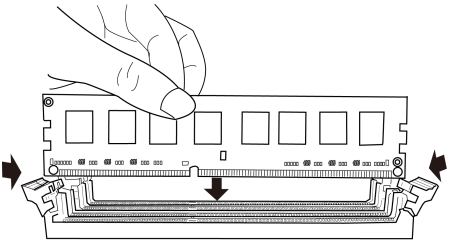
2-4-3. Installing Memory Modules

- This motherboard accommodates four memory modules. It can support four 240-pin DDR3 1600/1333 MHz.
- Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.
- You must install at least one module in any of the four slots. Total memory capacity is 32 GB.
- Refer to the following to install the memory modules.

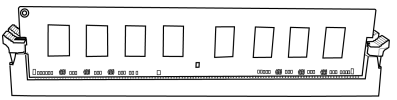
A. Push the latches on each side of the DIMM slot down.



B. Install the DIMM module into the slot and press it firmly down until it seats correctly. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.



C. The slot latches are levered upwards and latch on to the edges of the DIMM.



The four DDR3 memory sockets (DDR3_1, DDR3_2, DDR3_3 and DDR3_4) are divided into two channels and each channel has two memory sockets as following:

Channel A: DDR3_1, DDR3_2
Channel B: DDR3_3, DDR3_4

Recommend memory configuration

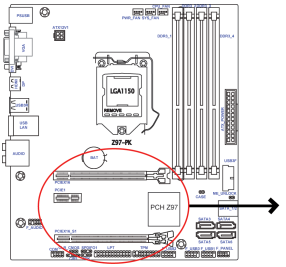
Model	Sockets			
	DDR3_1	DDR3_2	DDR3_3	DDR3_4
1 DIMM	~	Populated	~	~
1 DIMM	~	~	~	Populated
2 DIMMs	~	Populated	~	Populated
3 DIMMs	Populated	Populated	~	Populated
3 DIMMs	~	Populated	Populated	Populated
4 DIMMs	Populated	Populated	Populated	Populated

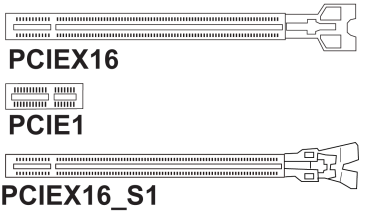
Due to Intel CPU spec definition, please follow the table above for recommended memory configuration.

1. For best performance and compatibility, we recommend that users give priority to the white DIMMs (DDR3_2/DDR3_4) when installing DIMMs.
2. We suggest users not to mix memory type. It is recommended to use the same brand and type memory on this motherboard.

2-4-4. Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.





PCIEX16 Slot The PCI Express x16 slot is used to install an external PCI Express graphics card that is fully compliant to the PCI Express Base Specification revision 3.0.

PCIE1 Slot The PCI Express x1 slot is fully compliant to the PCI Express Base Specification revision 2.0.

PCIEX16_S1 Slot This slot is fully compliant to the PCI Express Base Specification revision 2.0 which runs at x4 mode.

Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Recommend add_on card configuration

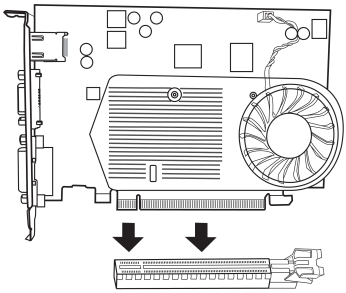
Model	PCIEX16 Slots	
	PCIEX16	PCIEX16_S1
SPEC	PCI-E Gen.3 Running x16 mode	PCI-E Gen.2 Running x4 mode
Color	Gray	Black
1 Graphic Card (VGA card)	Populated	--

Follow these instructions to install an add-on card:

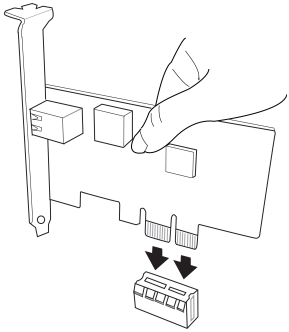
1 Remove a blanking plate from the system case corresponding to the slot you are going to use.
2 Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
3 Secure the metal bracket of the card to the system case with a screw.

For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.

Please refer the following illustrations to install the add-on card:



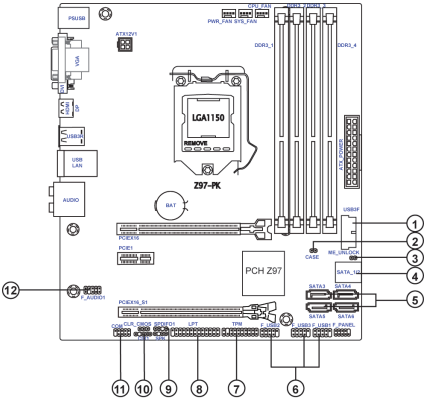
Install the VGA Card in the PCIE X16 slot



Install the LAN Card in the PCIE X1 slot

2-4-5. Connecting Optional Devices

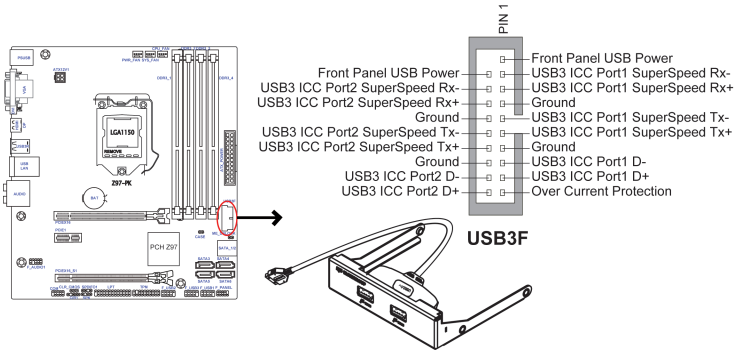
Refer to the following for information on connecting the motherboard's optional devices:



No.	Components	No.	Components
1	USB3F	7	TPM
2	CASE	8	LPT
3	ME_UNLOCK	9	SPDIFO1
4	SATA_1/2	10	CIR1
5	SATA3~6	11	COM
6	F_USB1~3	12	F_AUDIO1

1. USB3F: Front Panel USB 3.0 header

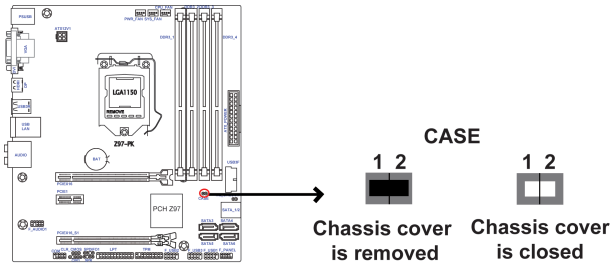
This Motherboard implements one USB 3.0 header supporting 2 extra front USB 3.0 ports, which delivers 5Gb/s transfer rate.



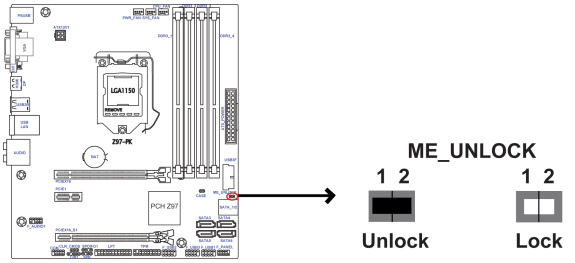
Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

2. CASE: Chassis Intrusion Detect Header

This detects if the chassis cover has been removed. This function needs a chassis equipped with instrusion detection switch and needs to be enabled in BIOS.

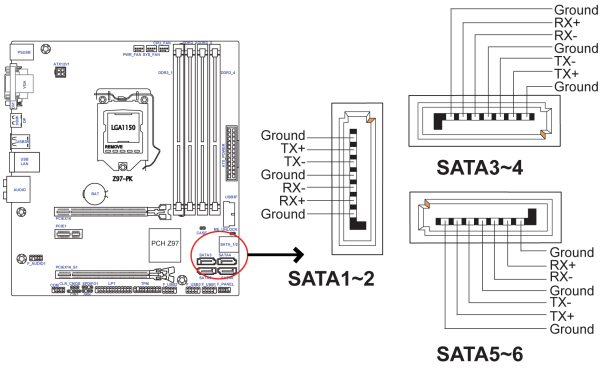


3. ME_UNLOCK: ME Unlock Header



4 & 5. SATA1~6: Serial ATA connectors

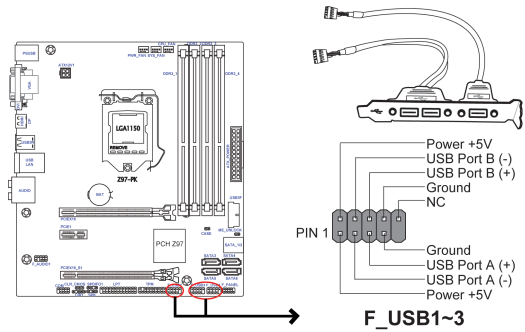
SATA1~6 connectors are used to support the Serial ATA 6.0Gb/s device, simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.



6. F_USB1~3: Front Panel USB 2.0 headers

The motherboard has three USB 2.0 headers supporting six USB 2.0 ports. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector to connect the front-mounted ports to the motherboard.

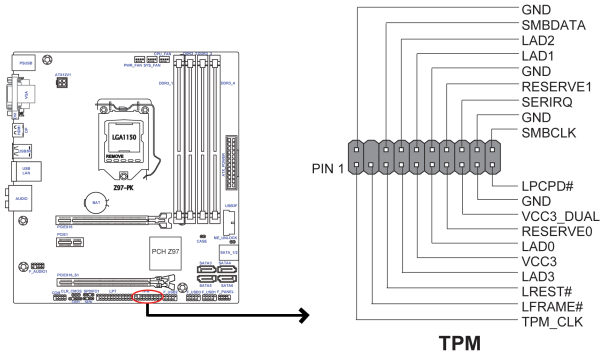
Unlike F_USB2 & F_USB3, F_USB1 supports EZ Charger technology, provides 3 times current than general USB port in off mode for USB devices. It is useful and excellent, especially for the iPhone, iPad and iPod touch devices that need a large amount of current for faster recharging within less time.



Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

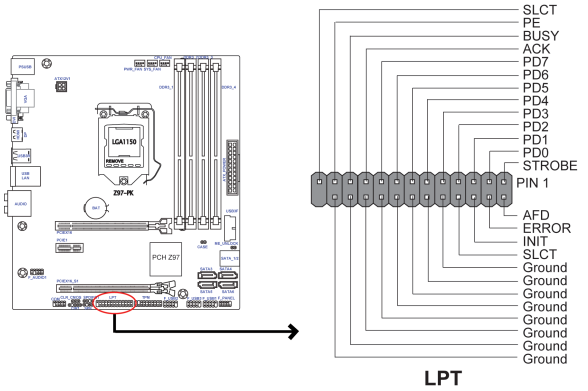
7. TPM: Trusted Platform Module header

Trusted platform module (TPM) is a published specification detailing a microcontroller that can store secured information, and implementations of that specification.



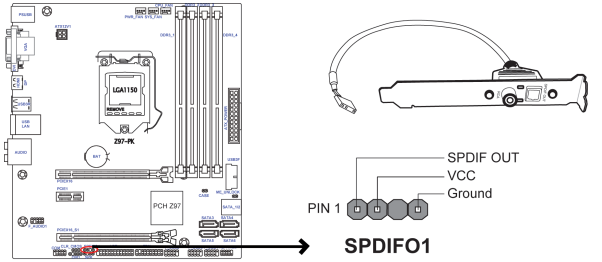
8. LPT: Onboard parallel port header

This is a header that can be used to connect to the printer, scanner or other devices.

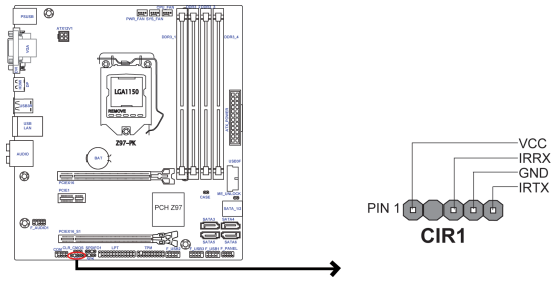


9. SPDIFO1: SPDIF out header

This is an optional header that provides an SPDIFO (Sony/Philips Digital Interface) output to digital multimedia device through optical fiber or coaxial connector.

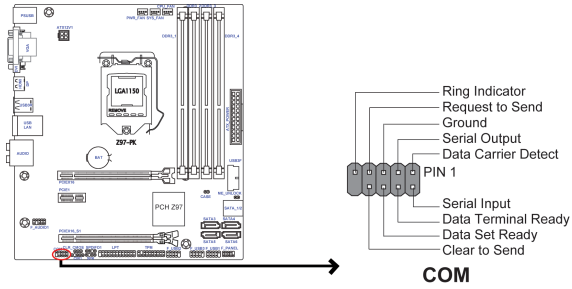


10. CIR1: Consumer Infrared Header



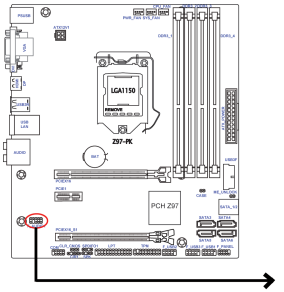
11. COM: Onboard serial port header

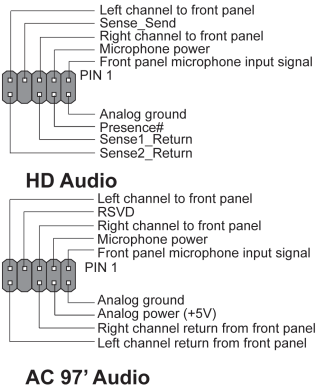
Connect a serial port extension bracket to this header to add a serial port to your system.



12. F_AUDIO1: Front Panel Audio Header

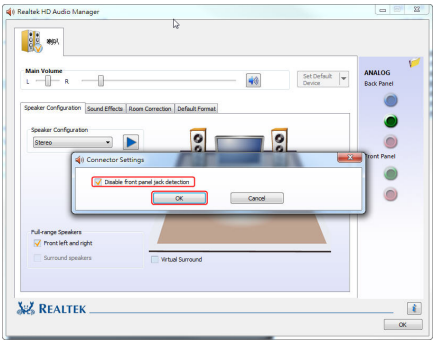
The front panel audio header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access. This header supports HD audio by default. If you want connect an AC' 97 front panel audio to HD onboard headers, please set as below picture.





AC' 97 Audio Configuration: To enable the front panel audio connector to support AC97 Audio mode.

If you use AC' 97 Front Panel, please tick off the option of "Disabled Front Panel Detect ". If you use HD Audio Front Panel, please don' t tick off "Disabled Front Panel Detect ".



** For reference only*

If you use AC' 97 Front Panel, please don' t tick off "Using Front Jack Detect ". If you use HD Audio Front Panel, please tick off the option of "Using Front Jack Detect ".

** For reference only*

2-4-6. Installing a SATA Hard Drive

This section describes how to install a SATA Hard Drive.

About SATA Connectors

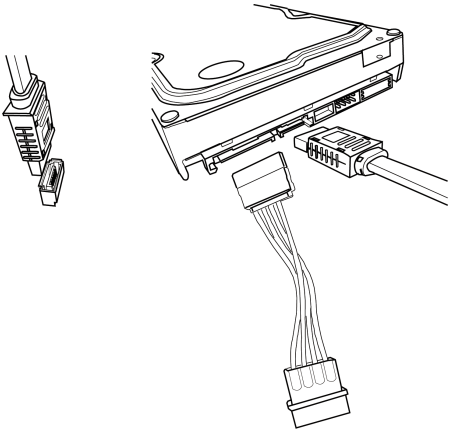
Your motherboard features six SATA connectors supporting a total of six drives. SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. This SATA cable comes with a SATA power cable. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.

Refer to the illustration below for proper installation:

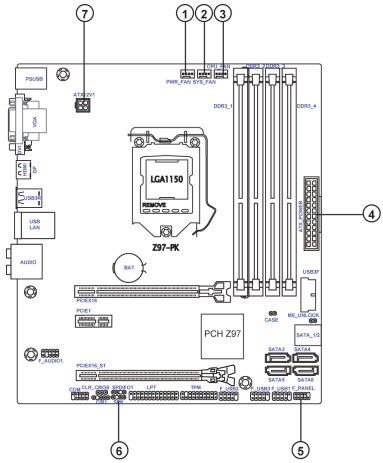
1 Attach either cable end to the connector on the motherboard.
2 Attach the other cable end to the SATA hard drive.
3 Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.



** For reference only*

2-4-7. Connecting Case Components

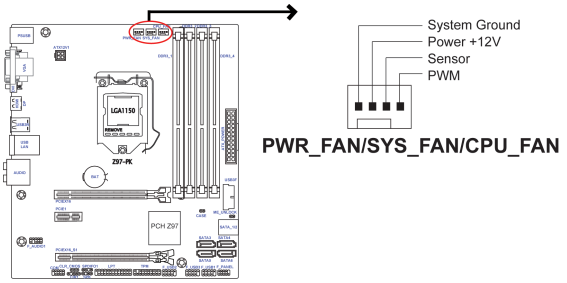
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:



No.	Components	No.	Components
1	PWR_FAN	5	F_PANEL
2	SYS_FAN	6	SPK
3	CPU_FAN	7	ATX_12V
4	ATX_POWER	~	~

1. PWR_FAN (Power Cooling FAN Connector) & 2. SYS_FAN (System cooling FAN Connector) & 3. CPU_FAN (CPU Cooling FAN Connector)

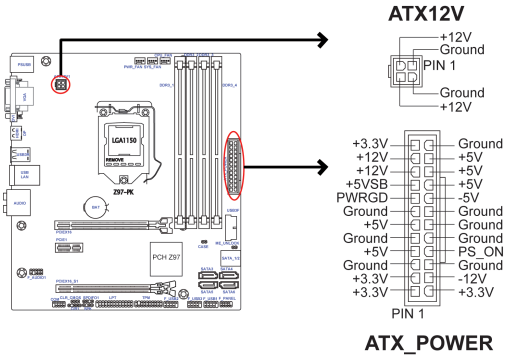
Connect the power cooling fan connector to **PWR_FAN**.
Connect the system cooling fan connector to **SYS_FAN**.
Connect the CPU cooling fan cable to **CPU_FAN**.



Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

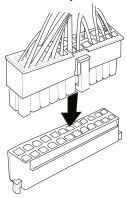
4. ATX_POWER (ATX 24-pin Power Connector) & 7. ATX12V (ATX 12V Power Connector)

Connect the standard power supply connector to **ATX_POWER**.
Connect the auxiliary case power supply connector to **ATX12V**.



Connecting 24-pin power cable

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.

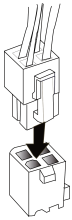


24-pin power cable

With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX match perfectly.

Connecting 4-pin power cable

The ATX12V4P power connector is used to provide power to the CPU.

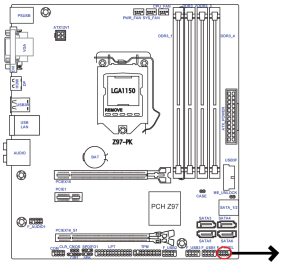


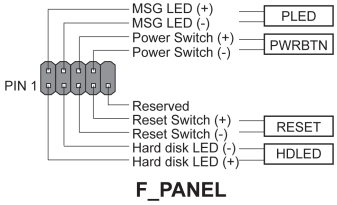
4-pin power cable

When installing 4-pin power cable, the latches of power cable and the ATX12V4P match perfectly.

5. F_PANEL: Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases. Refer to the table below for information:





Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

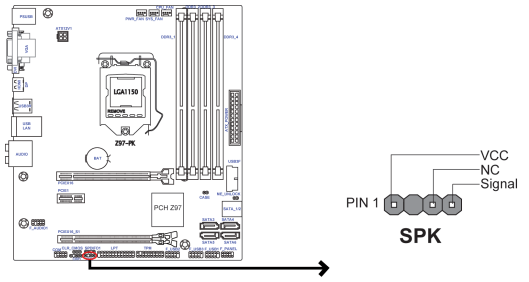
Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

6. SPK: Speaker header

Connect the case speaker cable to **SPK**.



This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3
Using BIOS

About the Setup Utility

The computer uses the latest "American Megatrends Inc. " BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

Press the delete key to access BIOS Setup Utility.

Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a "CMOS Settings Wrong" message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.

American Megatrends
Z97-PK Release 07/03/2014
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.
Press <F7> to enter BBS POPUP
Press <DEL> or <F2> to enter setup.
CMOS Settings Wrong

Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with an icon ≫) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by an icon ≫.

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

The BIOS navigation keys are listed below:

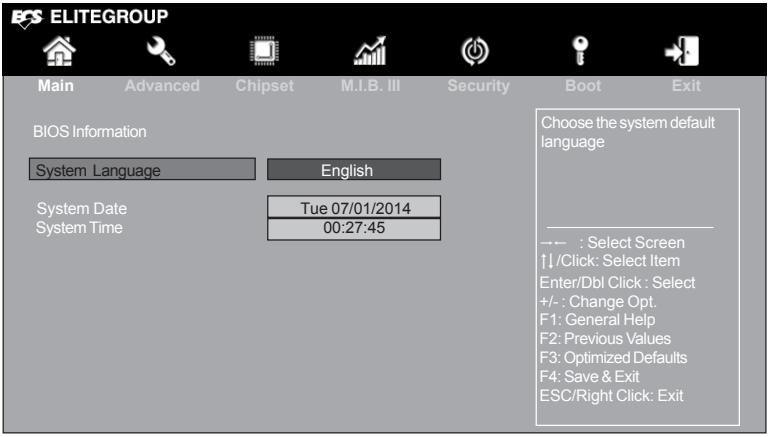
KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Change Opt.
Enter	Select
F1	General Help
F2	Previous Value
F3	Optimized Defaults
F4	Save & Exit

1. For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS. Please visit the manufacture's website for updated manual.

2. In this Gui BIOS, you can operate by mouse or keyboard. Click : select item; Double click: enter; Right click: exit.

Main Menu

This menu shows the information of BIOS and enables you to set the system language, date and time.



System Language (English)

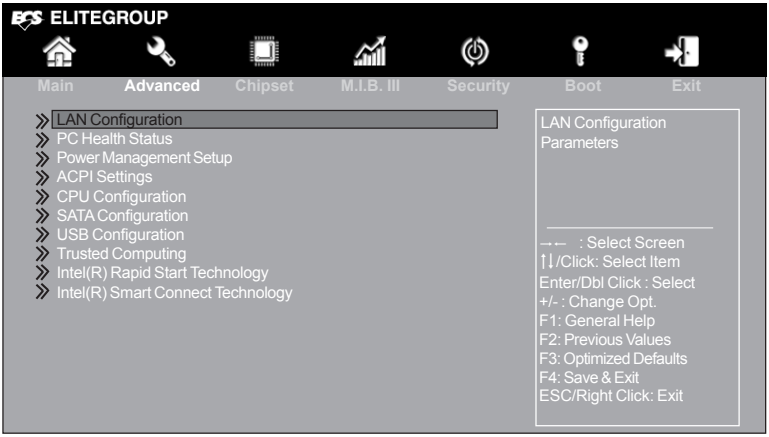
This item is used to set system language.

System Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

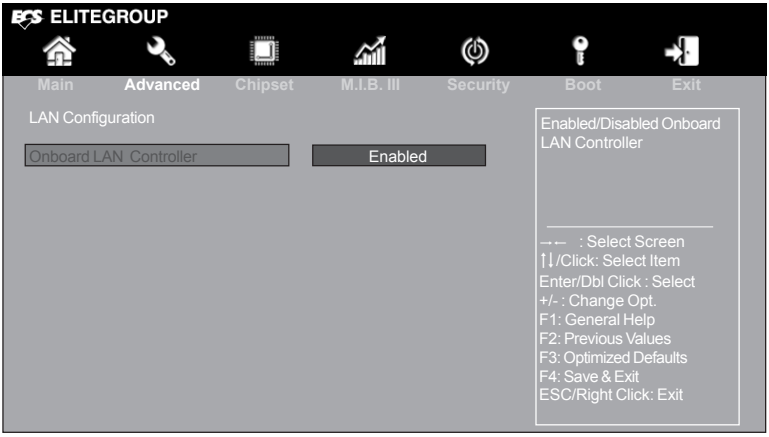
Advanced Menu

The Advanced menu items allow you to change the settings for the CPU and other system.



» LAN Configuration

The item in the menu shows the LAN-related information that the BIOS automatically detects.



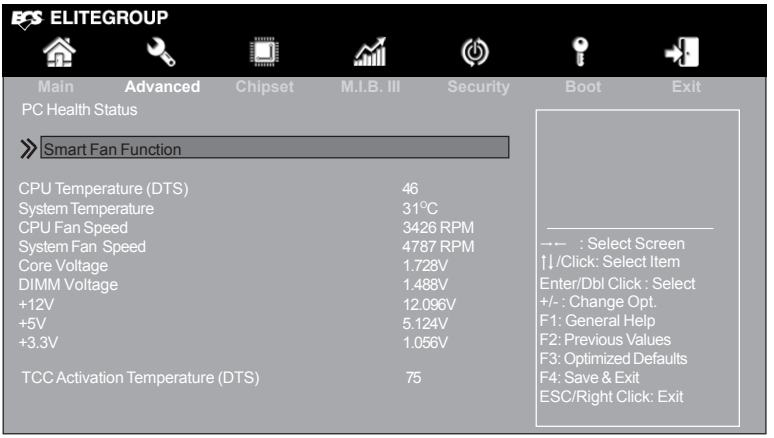
Onboard LAN Controller (Enabled)

Use this item to enable or disable Onboard LAN controller.

Press <Esc> to return to the Advanced Menu page.

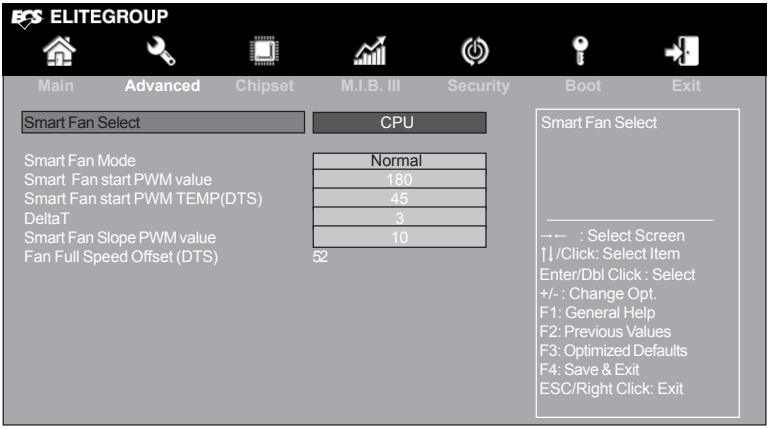
PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:



Smart Fan Select (CPU)

This item allows you to change and configure Smart Fans on M/B. ex. CPU Fan1, CPU Fan2, System Fan1.

Smart Fan Mode (Normal)

This item allows you to select the fan mode (Normal, Quiet, Silent, or Manual) for a better operation environment. If you choose Normal mode, the fan speed will be auto adjusted depending on the CPU temperature. If you choose Quite mode, the fan speed will be auto minimized for quiet environment. If you choose Silent mode, the fan speed will be auto restricted to make system more quietly. If you choose Manual mode, the fan speed will be adjust depending on users' parameters.

Smart Fan start PWM value (180)

This item is used to set the start PWM value of the smart fan.

Smart Fan start PWM TEMP (DTS) (45)

This item is used to set the start temperature of the smart fan.

DeltaT (3)

This item specifies the range that controls CPU temperature and keeps it from going so high or so low when smart fan works.

Smart Fan Slope PWM value (10)

This item is used to set the Slope Select PWM of the smart fan.

CPU Fan/System Fan Full Speed Offset (DTS) (52)

This item is used to set the CPU fan/System fan full speed offset value.

Press <Esc> to return to the PC Health Status page.

System Component Characteristics

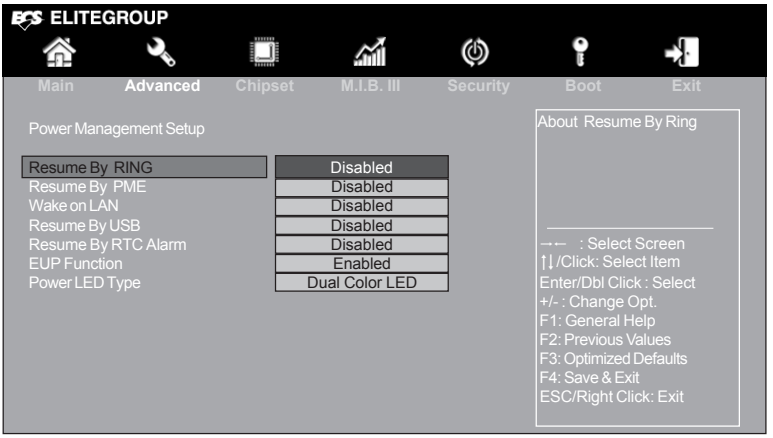
These items display the monitoring of the overall inboard hardware health events, such as CPU & DIMM voltage, CPU & System fan speed...etc.

- CPU Temperature (DTS)
- System Temperature
- CPU Fan Speed
- System Fan Speed
- Core Voltage
- DIMM Voltage
- +12V
- +5V
- +3.3V

Press <Esc> to return to the Advanced Menu page.

» Power Management Setup

This page sets up some parameters for system power management operation.



Resume By RING (Disabled)

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

Resume By PME (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the PCI/PCI-E Modem or PCI/PCI-E LAN card. You must use an ATX power supply in order to use this feature. Use this item to do wake-up action if inserting the PCI/PCI-E card.

Wake on LAN (Disabled)

Use this item to enable or disable integrated LAN to wake the system. (The wake on LAN cannot be disabled if ME is on at Sx state.) If disabled, resume by USB (S3) will not be available.

Resume By USB (Disabled)

This item allows you to enable or disable the USB device wakeup function from S3 mode.

Resume By RTC Alarm (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

EUP Function (Enabled)

This item allows user to enable or disable EUP support.

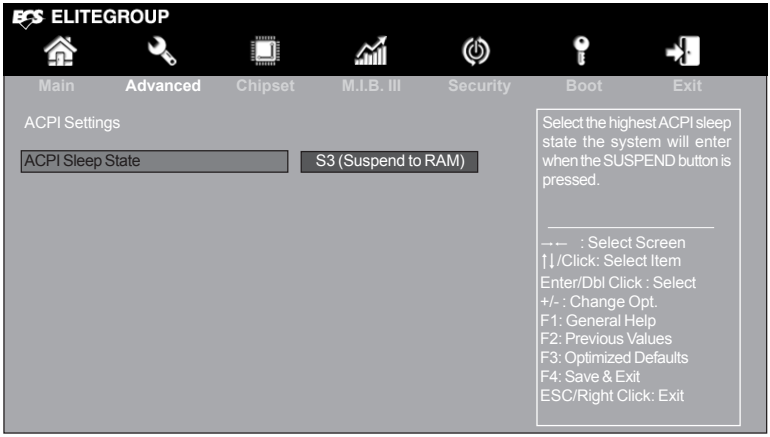
Power LED Type (Dual Color LED)

This item shows the type of the Power LED.

Press <Esc> to return to the Advanced Menu page.

≫ ACPI Settings

The item in the menu shows the highest ACPI sleep state when the system enters suspend.



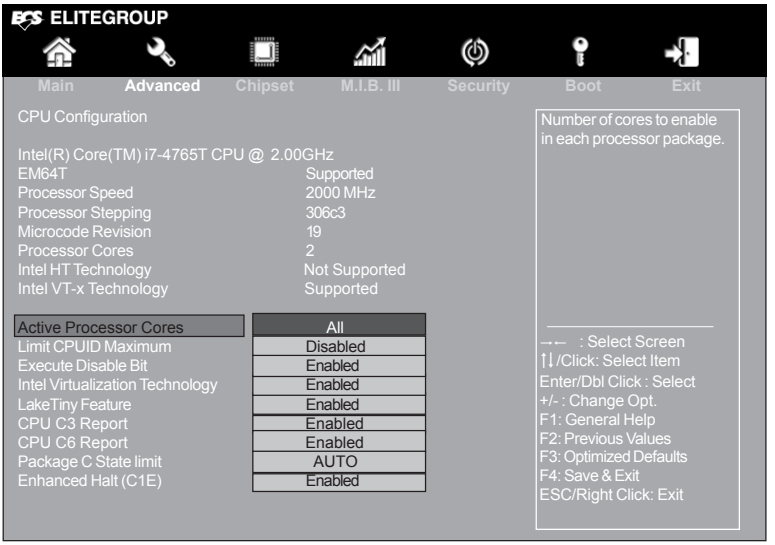
ACPI Sleep State [S3(Suspend to RAM)]

This item allows user to enter the ACPI S3 (Suspend to RAM) Sleep State (default).

Press <Esc> to return to the Advanced Menu page.

» CPU Configuration

The item in the menu shows the CPU.



Intel(R) Core(TM) i7-4765T CPU @ 2.00GHz

This is display-only field and displays the information of the CPU installed in your computer.

EM64T (Supported)

This item shows the computer supports EM64T.

Processor Speed (2000MHz)

This item shows the current processor speed.

Processor Stepping (306c3)

This item shows the processor stepping version.

Microcode Revision (19)

This item shows the Microcode version.

Processor Cores (2)

This item shows the core number of the processor.

Intel HT Technology (Not Supported)

This item shows the computer not supports Intel HT Technology.

Intel VT-x Technology (Supported)

This item shows the computer supports Intel VT-x Technology.

Active Processor Cores (All)

Use this item to control the number of active processor cores.

Limit CPUID Maximum (Disabled)

Use this item to enable or disable the maximum CPUID value limit, you can enables this item to prevent the system from “rebooting” when trying to install Windows NT 4.0.

Execute Disable Bit (Enabled)

This item allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation. Replacing older computers with Execute Disable Bit enabled systems can halt worm attacks, reducing the need for virus related repair.

Intel Virtualization Technology (Enabled)

When disabled, a VMM cannot utilize the additional hardware capabilities provided by Vandor Pool Technology.

LakeTiny Feature (Enabled)

Use this item to enable or disable the LakeTiny for C state configuration.

CPU C3 Report (Enabled)

Use this item to enable or disable CPU C3 (ACPI C2) report to OS.

CPU C6 Report (Disabled)

Use this item to enable or disable CPU C6 (ACPI C3) report to OS.

Package C State limit (AUTO)

Use this item to set the package C state limit.

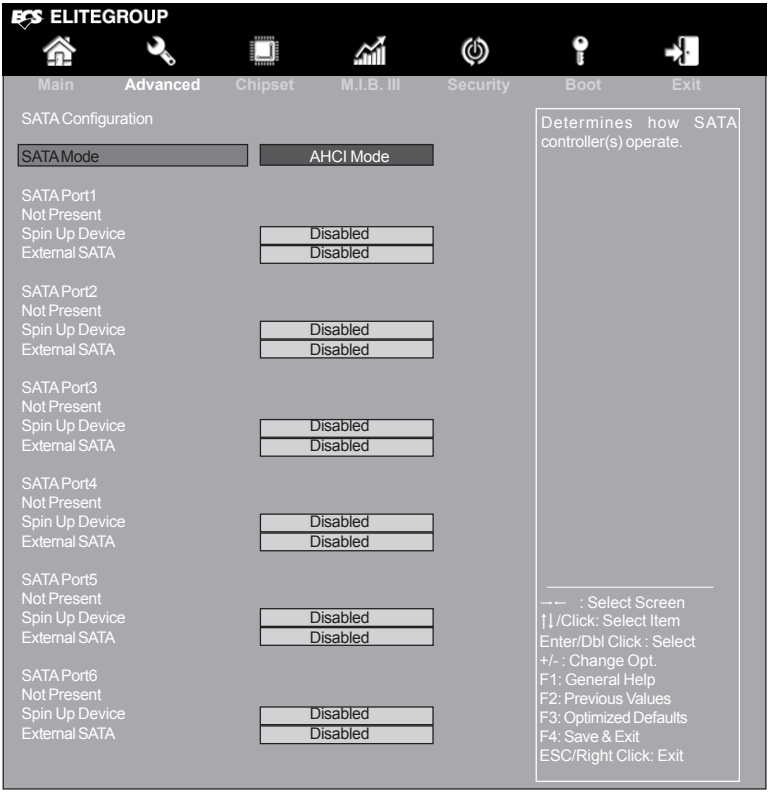
Enhanced Halt (C1E) (Enabled)

Use this item to enable or disable the Enhanced C1 state.

Press <Esc> to return to the Advanced Menu page.

»SATA Configuration

Use this item to show the mode of serial SATA configuration options.



SATA Mode (AHCI Mode)

Use this item to select SATA mode.

SATA Port 1~6 (Not Present)

This motherboard supports six SATA channels and each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.

Spin up Device (Disabled)

On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

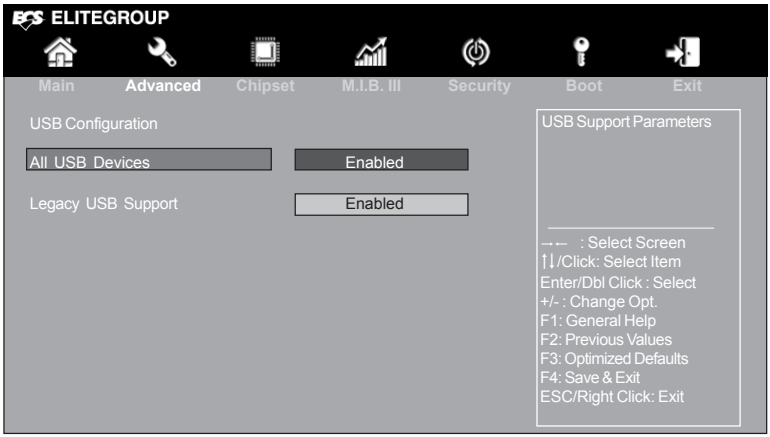
External SATA (Disabled)

Use this item to enable/disable External SATA Support.

Press <Esc> to return to the Advanced Menu page.

≫ USB Configuration

Use this item to show the information of USB configuration.



All USB Devices (Enabled)

Use this item to enable or disable all USB devices.

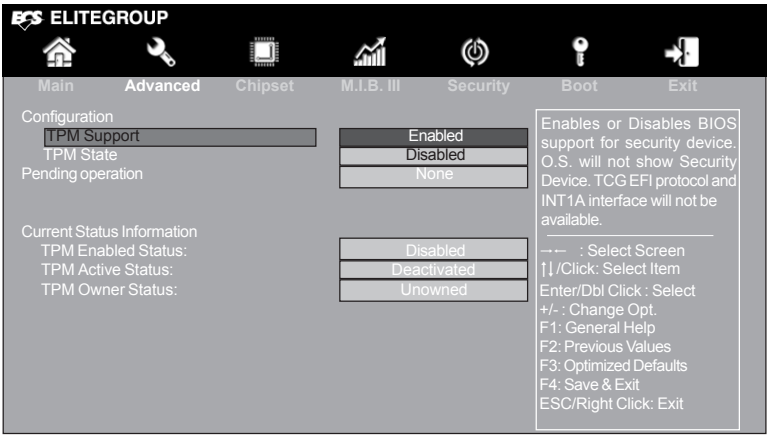
Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB devices.

Press <Esc> to return to the Advanced Menu page.

» Trusted Computing

Use this item to show the information of trusted computing configuration.



TPM Support (Enabled)

Use this item to enable or disable the TPM support. O.S. will not show TPM. Reset of platform is required.

TPM State (Disabled)

Use this item to enable or disable the security device.

Pending operation (None)

Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

TPM Enabled Status (Disabled)

This item displays the TPM status to be enabled or not.

TPM Active Status (Deactivated)

This item displays the TPM status to be activated or not.

TPM Owner Status (Unowned)

This item displays the TPM status to be owned or not.

Press <Esc> to return to the Advanced Menu page.

≫ Intel(R) Rapid Start Technology

Use this item to show the information of Intel(R) Rapid Start Technology.

Intel(R) Rapid Start Technology (Disabled)

Use this item to enable or disable the Intel(R) Rapid Start Technology.

Press <Esc> to return to the Advanced Menu page.

≫ Intel(R) Smart Connect Technology

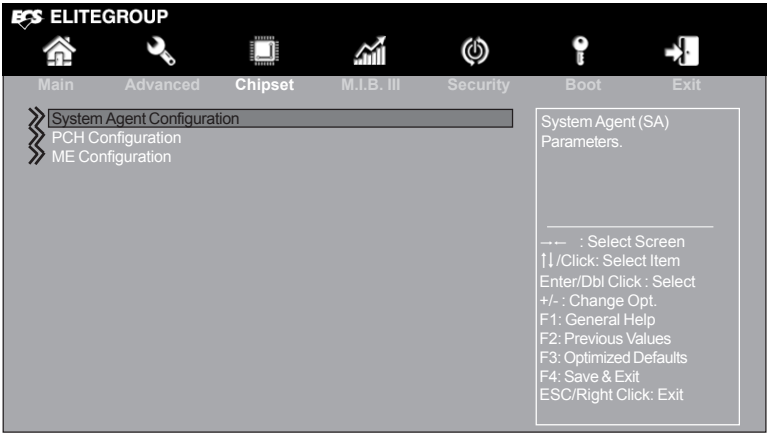
Use this item to show the information of Intel(R) Smart Connect Technology.

ISCT Configuration (Disabled)

Use this item to enable or disable ISCT configuration.

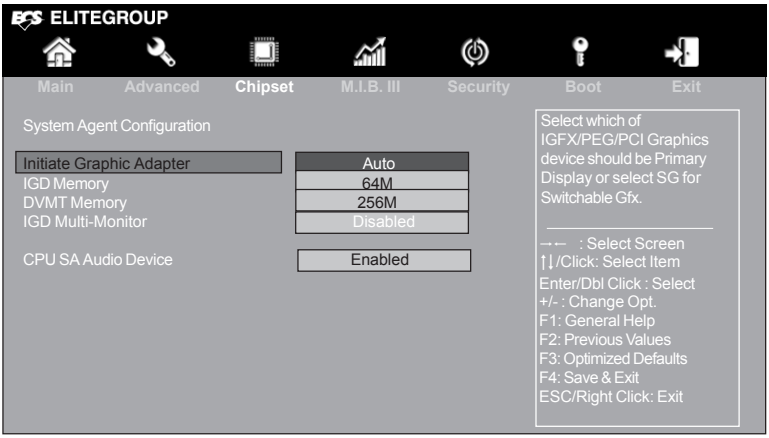
Chipset Menu

The chipset menu items allow you to change the settings for the North Bridge chipset, South Bridge chipset and other system.



≫ System Agent Configuration

Scroll to this item and press <Enter> to view the following screen:



Initiate Graphic Adapter (Auto)

This item allows you to select graphics controller to use as the primary boot device.

IGD Memory (64M)

This item shows the information of the IGD (Internal Graphics Device) memory.

DVMT Memory (256M)

When set to Fixed Mode, the graphics driver will reserve a fixed position of the system memory as graphics memory, according to system and graphics requirements.

IGD Multi-Monitor (Disabled)

This item allows you to enable or disable the IGD Multi-Monitor.

CPU SA Audio Device (Enabled)

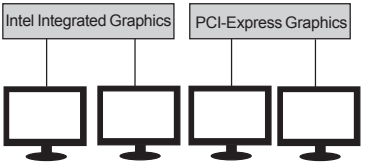
This item allows you to enable or disable the CPU SA Audio device.

Press <Esc> to return to the Chipset Menu page.

Multi-Monitor technology

Multi-Monitor technology can help you to increase the area available for programs running on a single computer system through using multiple display devices.

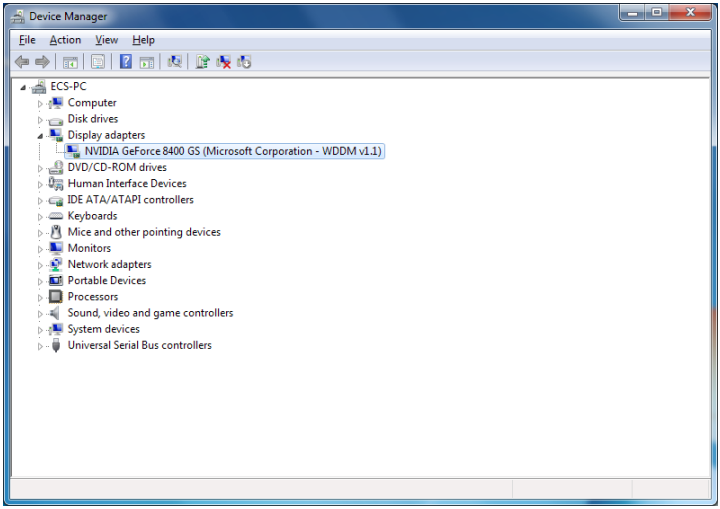
It is not only to increase larger screen viewing but aslo to improving personal productivity.



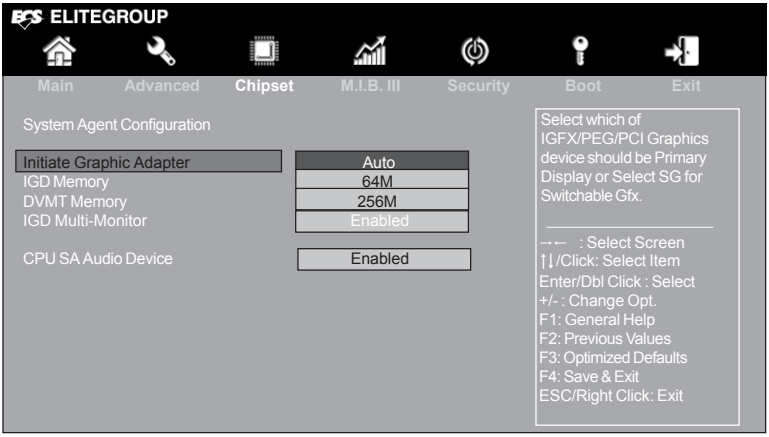
Please note that Multi-Monitor technology supports up to four monitors: one or two Intel integrated Graphics and one or two PCI-Express graphics devices under Windows 7/8.

Step 1. Insert ECS drives DVD to run Auto setup or browse the DVD to install Intel chipset drivers, VGA and sound drivers.(If you want know the detail information, please refer to chapter 4.)

Step 2. Install all the drivers of PCI-Express graphic cards. Click the Browse CD item, then appears the following screen. Select the driver you want to install(e.g NVIDIA GeForce 8400 GS(Microsoft Corporation-WDDM v1.1)) and double click it.

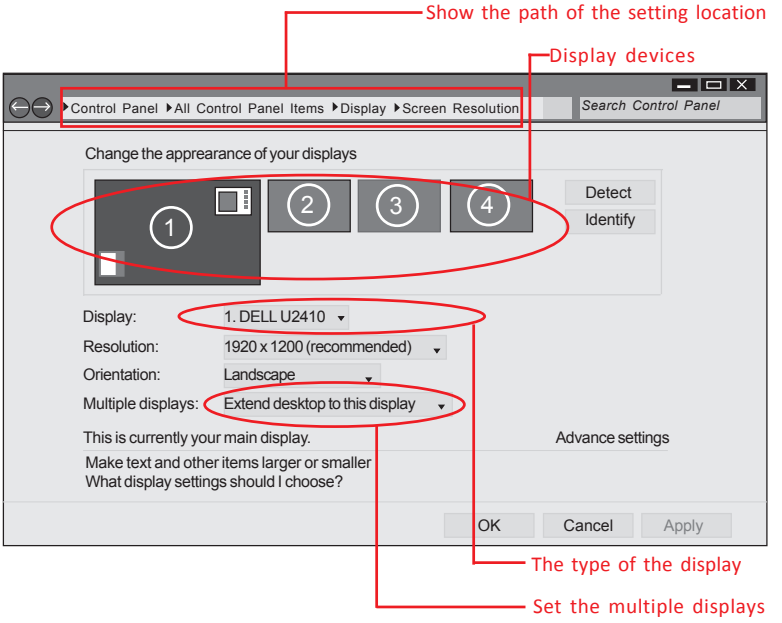


Step 3. Enable IGD Multi-Monitor from BIOS. In the following BIOS screen, please set IGD Multi-Monitor to [Enabled].

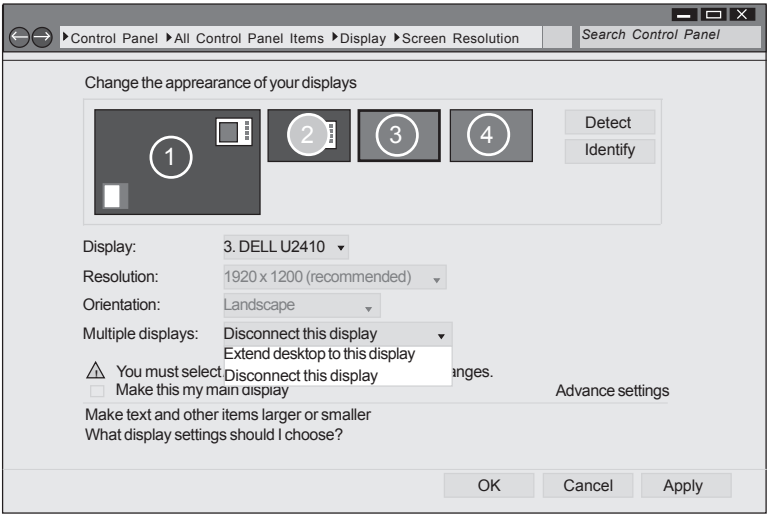


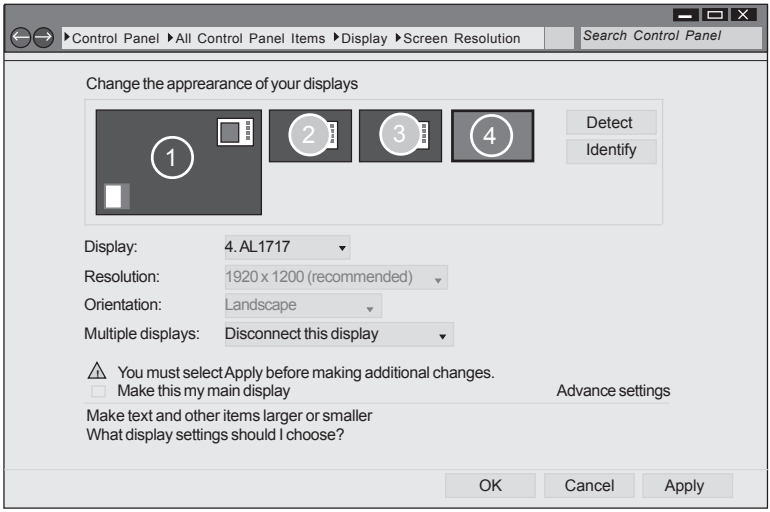
Step 4. Change the appearance of your displays under Windows 7/8.

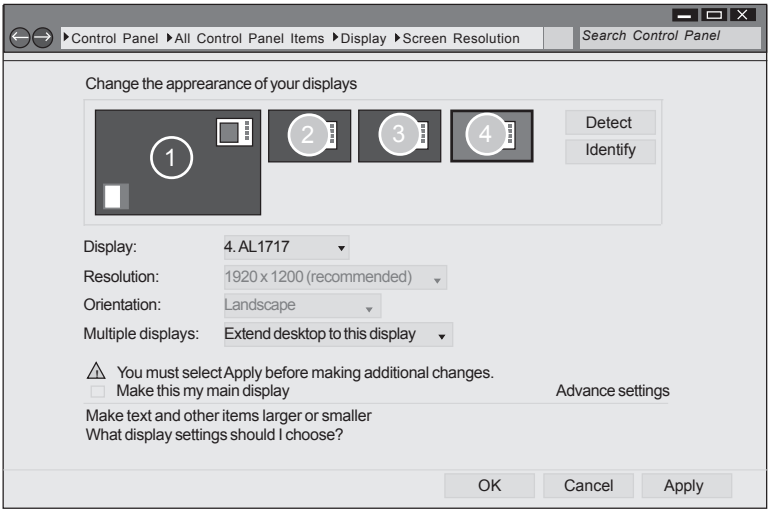
1. Enter the Control Panel menu, select the Display in the All Control Panel Items and click the Screen Resolution, then appears the following screen.



2.Select display devices, set the multiple displays option and to extend destop for display “Multi-Monitor technology”.

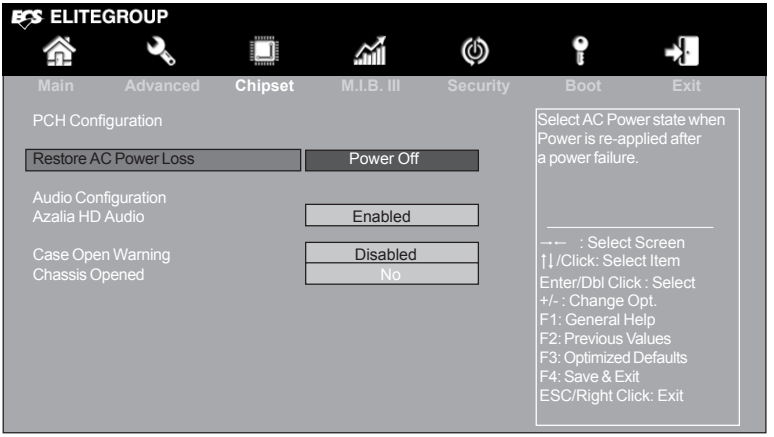



Control Panel All Control Panel Items Display Screen Resolution
Search Control Panel
Change the appearance of your displays
1
2
3
4
Detect
Identify
Display: 4. AL1717
Resolution: 1920 x 1200 (recommended)
Orientation: Landscape
Multiple displays: Disconnect this display
You must select Apply before making additional changes.
Make this my main display
Advance settings
Make text and other items larger or smaller
What display settings should I choose?
OK
Cancel
Apply


Control Panel All Control Panel Items Display Screen Resolution
Search Control Panel
Change the appearance of your displays
1
2
3
4
Detect
Identify
Display: 4. AL1717
Resolution: 1920 x 1200 (recommended)
Orientation: Landscape
Multiple displays: Extend desktop to this display
You must select Apply before making additional changes.
Make this my main display
Advance settings
Make text and other items larger or smaller
What display settings should I choose?
OK
Cancel
Apply

≫ PCH Configuration

Scroll to this item and press <Enter> to view the following screen:



Restore AC Power Loss (Power Off)

This item enables your computer to automatically restart or return to its operating status.

Azalia HD Audio (Enabled)

This item enables or disables Azalia HD audio.

Case Open Warning (Disabled)

This item enables or disables the warning if the case is opened up, and the item below indicates the current status of the case.

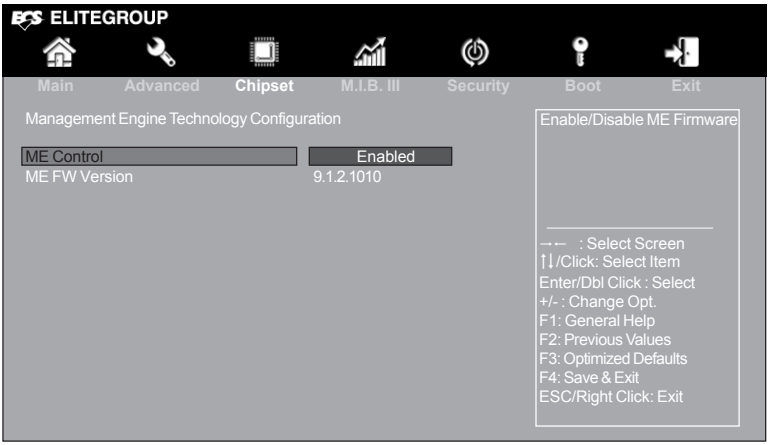
Chassis Opened (No)

This item indicates whether the case has been opened.

Press <Esc> to return to the Chipset Menu page.

≫ME Configuration

Scroll to this item and press <Enter> to view the following screen:



ME Control (Enabled)

Use this item to enable or disable the ME Firmware.

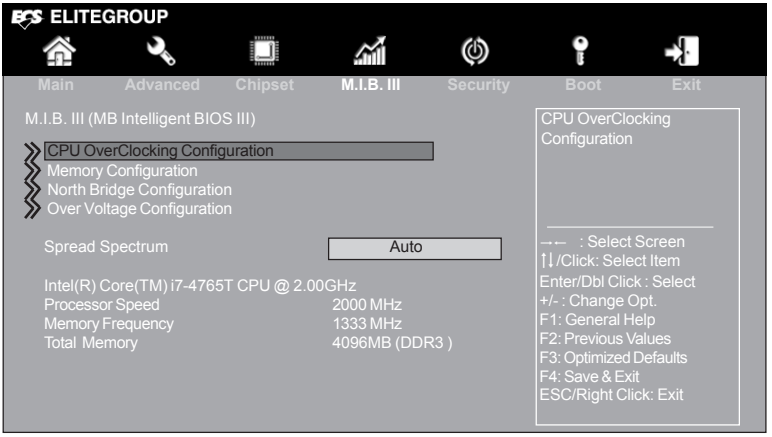
ME FW Version (9.1.2.1010)

This item shows the ME FW version.

Press <Esc> to return to the Chipset Menu page.

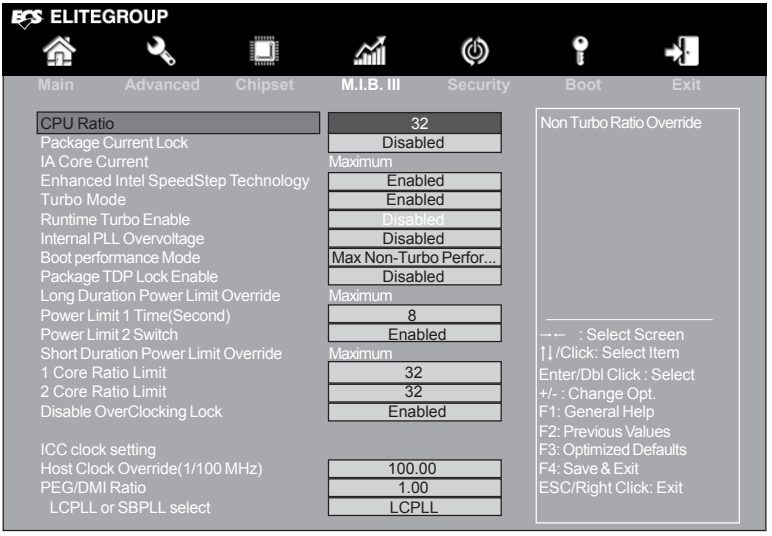
M.I.B. III (MB Intelligent BIOS III) Menu

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.



» CPU Configuration

Scroll to this item to view the following screen:



CPU Ratio (32)

This item allows users to control non turbo CPU ratio.

Package Current Lock (Disabled)

This item allows you to enable or disable the package current lock.

IA Core Current (Maximum)

This item allows you to set IA Core Current Max.

Enhanced Intel SpeedStep Technology (Enabled)

This item allows users to enable or disable the EIST (Enhanced Intel SpeedStep Technology).

Turbo Mode (Enabled)

This item allows you to control the Intel Turbo Boost Technology.

Runtime Turbo Enable (Disabled)

This item allows users to control non turbo CPU ratio.

Internal PLL Overvoltage (Disabled)

This item allows users to control the internal PLL overvoltage.

Boot performance Mode (Turbo Performance)

Use this item to select the performance state that the BIOS will set before OS handoff.

Package TDP Lock Enable (Disabled)

This item allows you to enable or disable the package TDP lock.

Long Duration Power Limit Override (Maximum)

Intel(R) Turbo Boost Technology will use this power limit during the long duration power limit time window.

Power Limit 1 Time(Second) (8)

This item allows you to set the power limit 1 time.

Power Limit 2 Switch (Enabled)

This item allows you to enable or disable the power limit 2 switch.

Short Duration Power Limit Override (Maximum)

Intel(R) Turbo Boost Technology will use this power limit for a very short duration. After that, the long duration power limit will be honored.

1 /2 Core Ratio Limit (32)

These items show the Core Ratio Limit Value.

Disable OverClocking Lock (Enabled)

This item allows you to control the OverClocking lock.

Host Clock Override(1/100 MHz) (100.00)

This item shows the informtion of the host clock override.

PEG/DMI Ratio (1.00)

This item shows the informtion of the PEG/DMI Ratio.

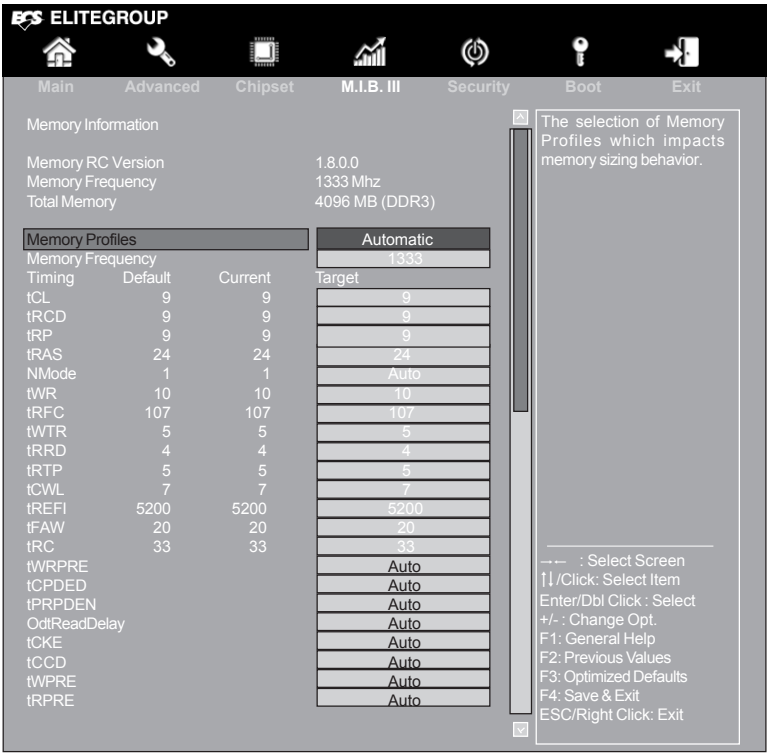
LCPLL or SBPLL select (LCPLL)

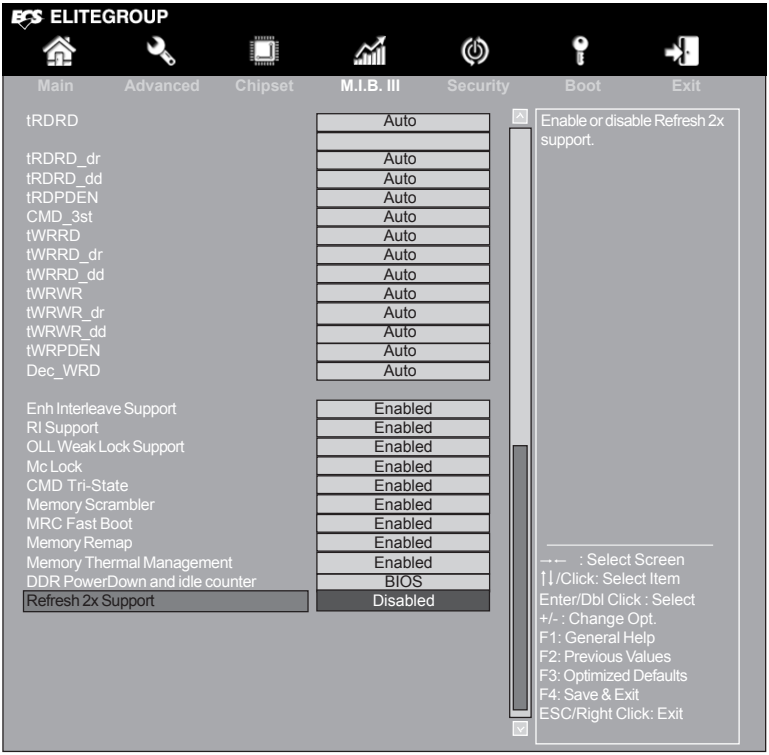
This item shows the informtion of the ICC clocking mode.

Press <Esc> to return to the M.I.B. III Menu page.

» Memory Configuration

Scroll to this item to view the following screen:





Memory RC Version (1.8.0.0)

This item shows the information of the memory RC version.

Memory Frequency (1333 Mhz)

This item shows the information of the memory frequency.

Total Memory (4096 MB (DDR3))

This item shows the information of the total memory.

Memory Profiles (Automatic)

This item enables you to set the memory profiles. The selection of memory profiles impacts memory sizing behavior.

Enh Interleave Support (Enabled)

This item allows you to enable or disable the Enh Interleave support.

RI Support (Enabled)

This item allows you to enable or disable the Rank Interleave support. NOTE: RI and HORI can not be enabled at the same time.

DLL Weak Lock Support (Enabled)

This item allows you to enable or disable the DLL weak lock support.

Mc Lock (Enabled)

This item allows you to enable or disable capacity to lock MC registers or not.

CMD Tri-State (Enabled)

This item allows you to enable or disable the CMD Tri-State (ending of the training).

Memory Scrambler (Enabled)

This item allows you to enable or disable the memory scrambler.

WRC Fast Boot (Enabled)

This item allows you to enable or disable the WRC fast boot.

Memory Remap (Enabled)

This item allows you to enable or disable the memory remap above 4G.

Memory Thermal Management (Enabled)

This item allows you to enable or disable the memory thermal management.

DDR PowerDown and Idle counter (BIOS)

This item allows you to BIOS or PCODE the DDR Power Down and Idle counter. BIOS: BIOS is in countrol of DDR CKE mode and idle timer value. PCODE: pcode will manage the modes.

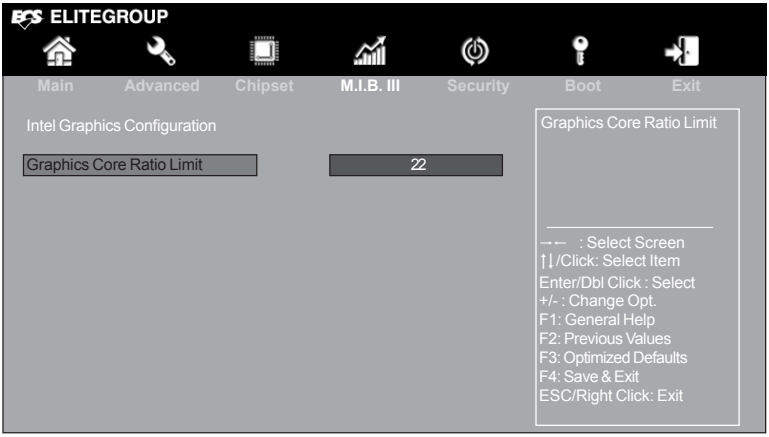
Refresh 2x Support (Disabled)

This item allows you to enable or disable 2xRef when warm and Hot 2-iMC enables 2xRef when Hot.

Press <Esc> to return to the M.I.B. III Menu page.

» North Bridge Configuration

Scroll to this item to view the following screen:



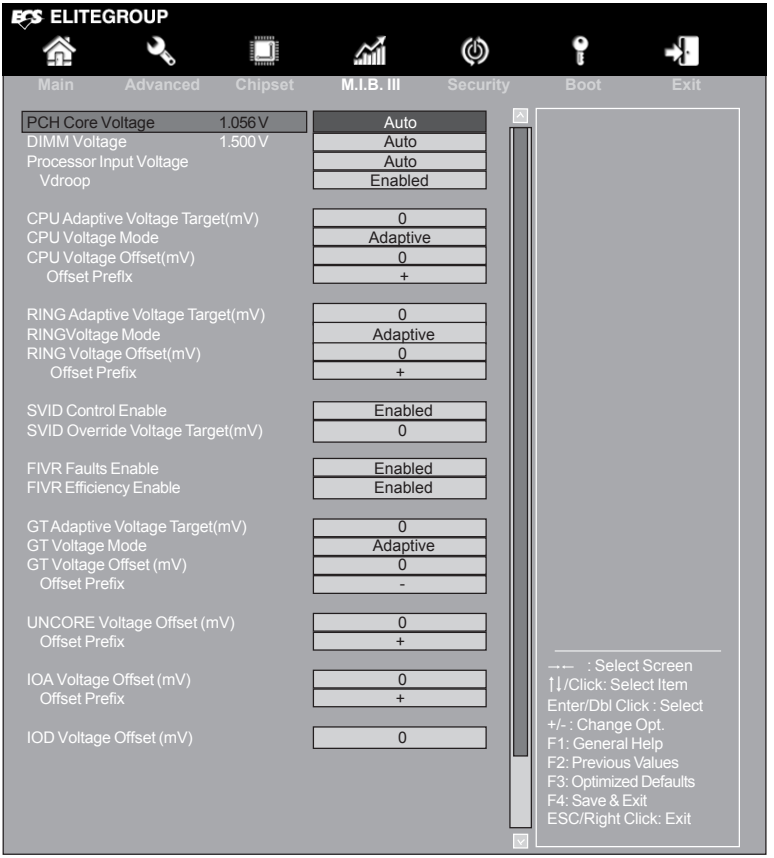
Graphics Core Ratio Limit (22)

This item allows you to control the internal GFX core ratio.

Press <Esc> to return to the M.I.B. III Menu page.

» Over Voltage Configuration

Scroll to this item to view the following screen:



PCH Core Voltage 1.056 V (Auto)

This item allows you to adjust the PCH Core voltage.

DIMM Voltage 1.488 V (Auto)

This item allows you to adjust the DIMM voltage.

Processor Input Voltage (Auto)

This item allows you to adjust the processor input voltage.

Vdroop (Enabled)

Use this item to enable or disable the Vdroop.

CPU/RING/GT Adaptive Voltage Target(mV) (0)

This item allows you to adjust the CPU/RING/GT Adaptive voltage target from 0 to 2000mV.

CPU/RING/GT Voltage Mode (Adaptive)

This item allows you to set the CPU/RING/GT voltage mode.

CPU/RING/GT/UNCORE/IOA/IOD Voltage Offset(mV) (0)

This item allows you to adjust the CPU/RING/GT/UNCORE/IOA/IOD voltage offset from -1000 to 998mV.

Offset Prefix (+)

This item allows you to select the offset value as positive (+) or negative (-).

SVID Control Enable (Enabled)

This item allows you to enable or disable the SVID control. If this function be disabled, it will not be changed until CPU powers down.

SVID Override Voltage Target(mV) (0)

This item allows you to adjust the SVID override voltage target, up to 2500mV.

FIVR Faults Enable (Enabled)

This item allows you to enable or disable the FIVR faults. If this function is disabled, it will not be changed until CPU powers down.

FIVR Efficiency Enable (Enabled)

This item allows you to enable or disable the FIVR efficiency. If this function is disabled, it will not be changed until CPU powers down.

Press <Esc> to return to the M.I.B. III Menu page.

Spread Spectrum (Auto)

If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

Intel(R) Core(TM) i7-4765T CPU @ 2.00GHz

This is display-only field and displays the information of the CPU installed in your computer.

Processor Speed (2000 MHz)

This item shows the CPU speed.

Memory Frequency (1333 MHz)

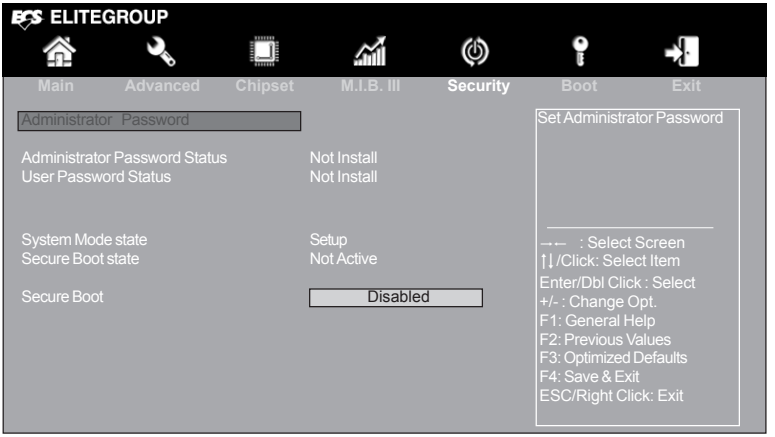
This item shows the memory frequency.

Total Memory (4096 MB (DDR3))

This item shows the total memory.

Security Menu

This page enables you to set setup administrator password and user password.



Administrator Password Status (Not Install)

This item shows administrator password installed or not.

User Password Status (Not Install)

This item shows user password installed or not.

System Mode state (Setup)

This item shows system mode setup or not.

Secure Boot state (Not Active)

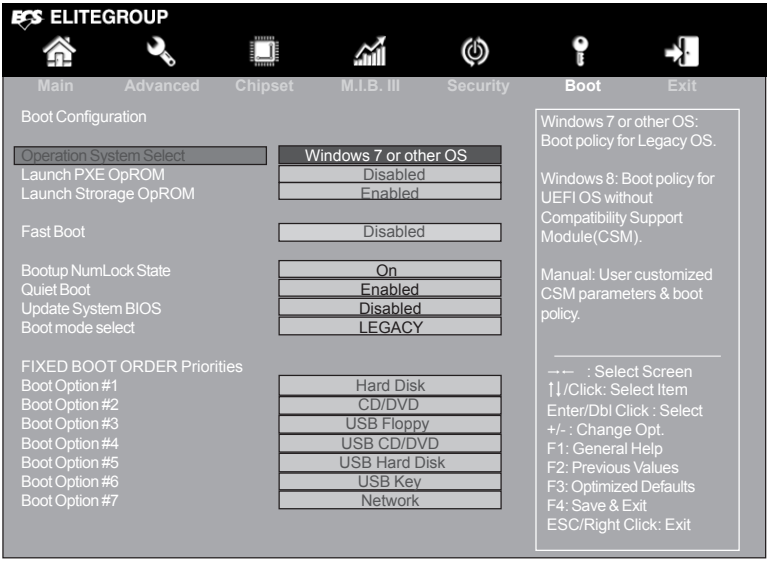
This item allows you to enable or disable the secure boot state.

Secure Boot (Disabled)

This item is used to control the secure boot flow, it is possible only if system runs in User Mode.

Boot Menu

This page enables you to set the keyboard NumLock state.



Boot Configuration

This item shows the information of the Boot Configuration.

Operation System Select (Windows 7 or other OS)

This item is used to select the operation system.

Launch PXE OpROM (Disabled)

The item enables or disables launch PXE Option ROM.

Launch Storage OpROM (Enabled)

Use this item to enable or disable the Storage OpROM.

Fast Boot (Disabled)

This item enables or disables boot with initialization of a minimal set of device required to launch active boot option. Has no effect for BBS boot options.

Bootup NumLock State (On)

This item enables you to select NumLock state.

Quiet Boot (Enabled)

This item enables or disables quiet boot.

Update System BIOS (Disabled)

This item enables or disables to update system BIOS.

Boot mode select (LEGACY)

Use this item to select boot mode.

Set Boot Priority

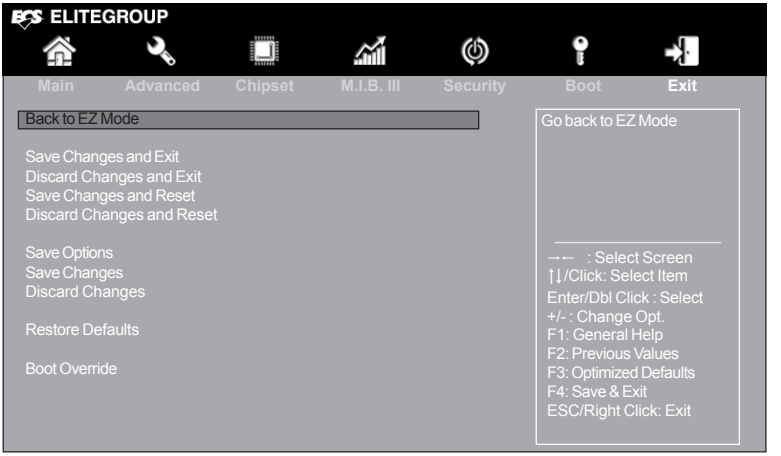
This item enables you to set boot priority for all boot devices.

Boot Option #1 /2 /3 /4 /5 /6 /7

These items show the boot priorities.

Exit Menu

This page enables you to exit system setup after saving or without saving the changes.



Back to EZ Mode

This item enables you to back to EZ mode.

Save Changes and Exit

This item enables you to exit the system setup after saving the changes.

Discard Changes and Exit

This item enables you to exit system setup without saving any changes.

Save Changes and Reset

This item enables you to reset system setup after saving the changes.

Discard Changes and Reset

This item enables you to reset system setup without saving any changes.

Save Options

This item enables you to save the options that you have made.

Save Changes

This item enables you to save the changes that you have made.

Discard Changes

This item enables you to discard any changes that you have made.

Restore Defaults

This item enables you to restore defaults to all the setup options.

Boot Override

Use this item to select the boot device.

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Website. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

1 If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.

2 If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)

3 Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)

4 Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.

5 Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)

6 At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AFUDOS.EXE 040706.ROM

7 When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

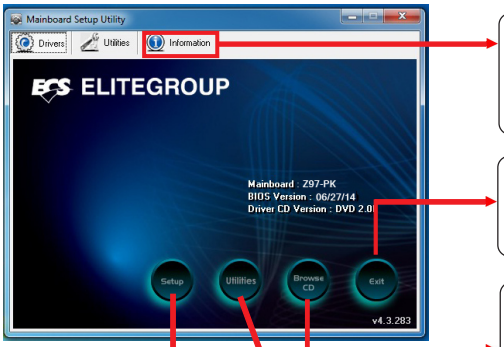
Memo

Chapter 4

Using the Motherboard Software

Auto-installing under Windows XP/7/8

The auto-install DVD-ROM makes it easy for you to install the drivers and software. The support software DVD-ROM disc loads automatically under Windows XP/7/8. When you insert the DVD-ROM disc in the DVD-ROM drive, the auto-run feature will automatically bring up the installation screen. The screen has four buttons on it: **Setup**, **Utilities**, **Browse CD** and **Exit**.



Information:
Displays the path for all software and drivers available on the disk.

Click "**Exit**" button to close the Auto-Setup window.

Browse CD:
Open Windows Explorer and show the contents of the support disk.

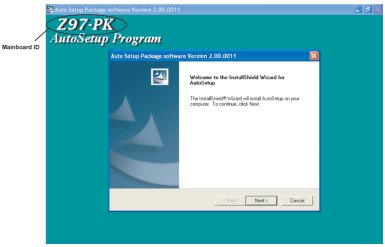
Click the "**Setup**" button to select and run the software installation program.

Click the "**Utilities**" button to select and install ECS Intelligent Utility.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

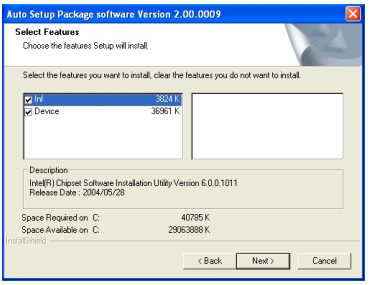
1. Click **Setup**. The installation program begins:



The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

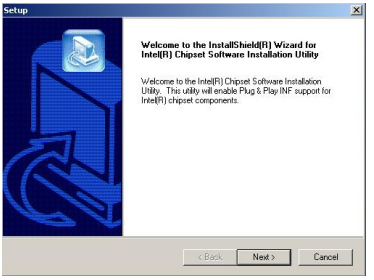
The motherboard identification is located in the upper left-hand corner.

2. Click **Next.** The following screen appears:


Auto Setup Package software Version 2.00.0009
Select Features
Choose the features Setup will install.
Select the features you want to install, clear the features you do not want to install.
Inf 3824 K
Device 36961 K
Description
Intel(R) Chipset Software Installation Utility Version 6.0.0.1011
Release Date : 2004/05/28
Space Required on C: 40795 K
Space Available on C: 29063888 K
InstallShield
< Back
Next >
Cancel

3. Check the box next to the items you want to install. The default options are recommended.

4. Click **Next** to run the Installation Wizard. An item installation screen appears:

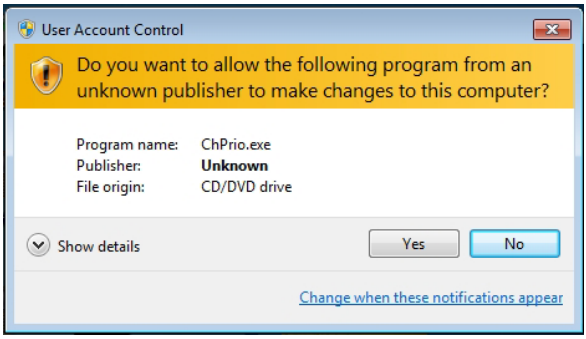

Setup
Welcome to the InstallShield(R) Wizard for Intel(R) Chipset Software Installation Utility
Welcome to the Intel(R) Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel(R) chipset components.
< Back
Next >
Cancel

5. Follow the instructions on the screen to install the items.

Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to re-start a few times to complete the installation.

Windows 8 will show the following screen after system restart, you must select "Desktop" in the bottom left to install the next driver.

Windows 7/8 will appear below UAC (User Account Control) message after the system restart. You must select "Yes" to install the next driver. Continue this process to complete the drivers installation.


User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: ChPrio.exe
Publisher: Unknown
File origin: CD/DVD drive
Show details
Yes
No
Change when these notifications appear

Manual Installation

If the auto-install DVD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Look for the chipset and motherboard model, and then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

ECS Utility Software (Intelligent EZ Utility)

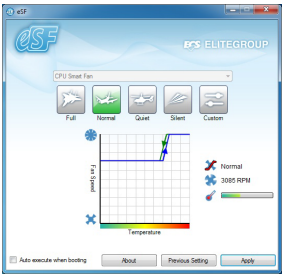
ECS Intelligent EZ Utility provides friendly interfaces under Windows O.S, which makes your computing more easily and conveniently.

These software(s) are subject to change at anytime without prior notice. Please refer to the support disk for available software.

eSF

eSF(Smart Fan) utility provides easy and safe way to adjust fan speed in accordance with your PC's system loading and temperature.

It has five modes to adjust fan speed in a safe range without entering the BIOS to optimize your system cooling environment.



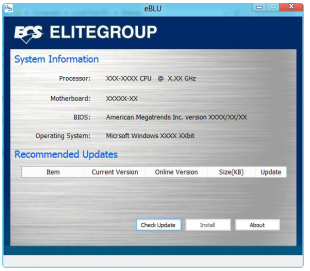
Microsoft .NET Framework 3.5 is required.

eDLU

ECS eDLU utility makes updating drivers fast and easy. eDLU saves time and hassle by listing all the latest drivers online. Just select the one you prefer and start to download and install the drivers.

eBLU

ECS eBLU utility makes BIOS update faster and easier. eBLU will list the latest BIOS with a default check-mark. Click"install" button to install.



Microsoft .NET Framework 3.5 is required.

Chapter 5

Intel® Rapid Storage Technology RAID Configuration

The Intel® Rapid Storage Technology allows you to configure RAID 0, and 1 sets on the external Serial ATA hard disk drives.

Before creating a RAID set

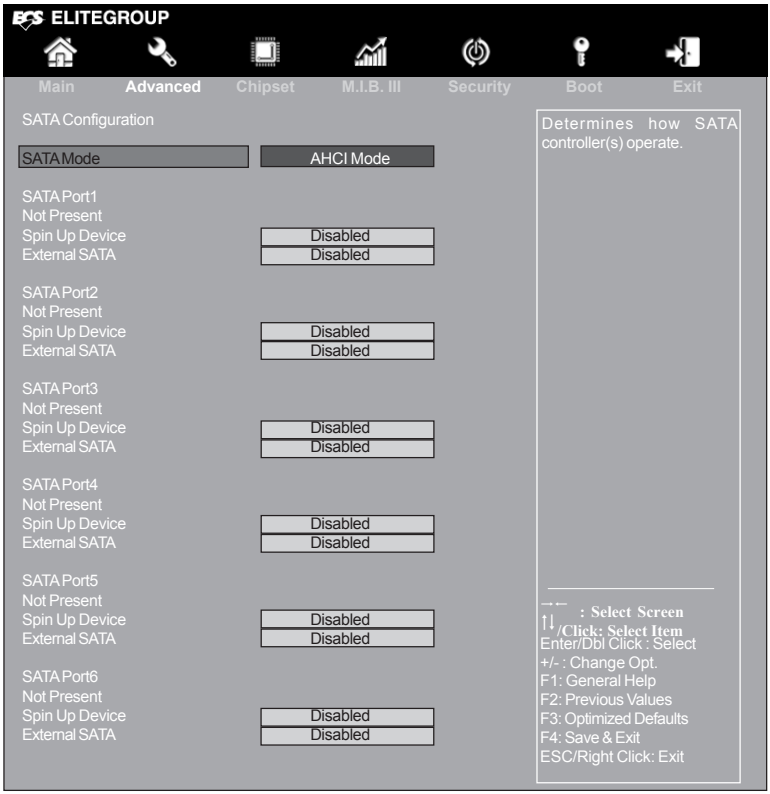
Prepare the following items:

1. One SATA HDD.
2. A write-enabled floppy disk.
3. Microsoft® Windows® OS installation disk (Windows 7/8/8.1).
4. Motherboard support CD with Intel® Rapid Storage Technology RAID driver.

Complete the following steps before you create a RAID set:

1. Install the external Serial ATA hard disk drive (HDD) on your system.
2. Set the *SATA Mode* item in the BIOS from *"IDE Mode"* to *"RAID* Mode"

   See section "SATA Configuration" for details.



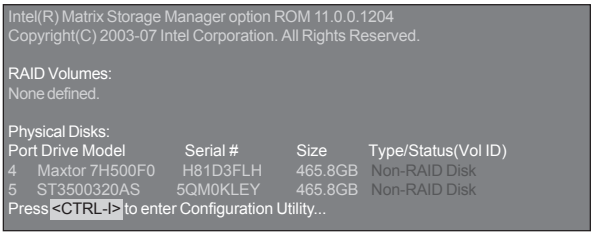
3. Enter the Intel® Rapid Storage Technology option to set up your RAID configuration.

4. Create an Intel® Rapid Storage Technology RAID driver disk for Windows® OS installation. See section "Creating a RAID driver disk" for details.

5. Install the Intel® Rapid Storage Technology RAID driver after the Windows® OS had been installed.

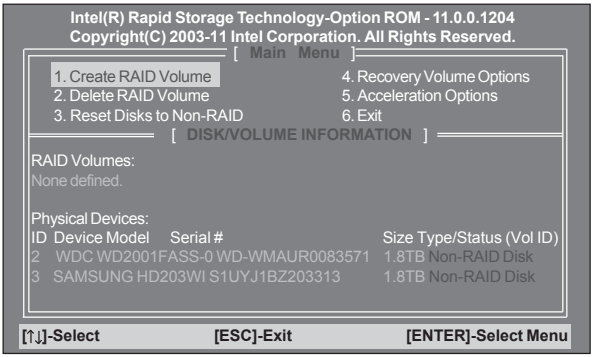
Entering Intel® Rapid Storage Technology RAID BIOS utility

1. During POST, press <Ctrl-I> to enter the Intel® Rapid Storage Technology RAID BIOS menu.


Intel(R) Matrix Storage Manager option ROM 11.0.0.1204
Copyright(C) 2003-07 Intel Corporation. All Rights Reserved.
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
4 Maxtor 7H500F0 H81D3FLH 465.8GB Non-RAID Disk
5 ST3500320AS 5QM0KLEY 465.8GB Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility...

2. The main Intel® Rapid Storage Technology RAID BIOS menu appears.

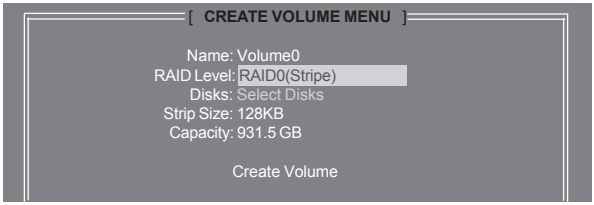
3. Use the arrow keys to move the color bar and navigate through the items.

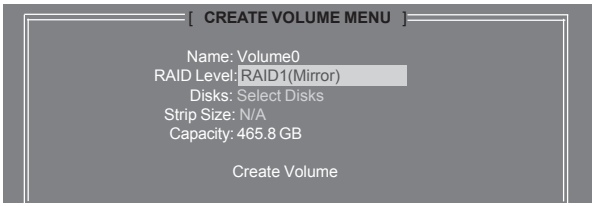

Intel(R) Rapid Storage Technology-Option ROM - 11.0.0.1204
Copyright(C) 2003-11 Intel Corporation. All Rights Reserved.
[Main Menu]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Recovery Volume Options
5. Acceleration Options
6. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Devices:
ID Device Model Serial # Size Type/Status (Vol ID)
2 WDC WD2001FASS-0 WD-WMAUR0083571 1.8TB Non-RAID Disk
3 SAMSUNG HD203WI S1UYJ1BZ203313 1.8TB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Creating a RAID set

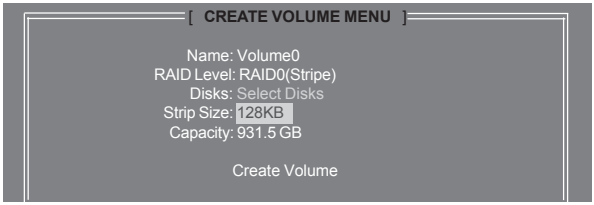
1. In the main Intel® Rapid Storage Technology RAID BIOS menu, highlight *Create RAID Volume* using the up/down arrow key then press <Enter>.

2. When the *RAID Level* item is highlighted, use the up/down arrow key to select the RAID set that you want to create.

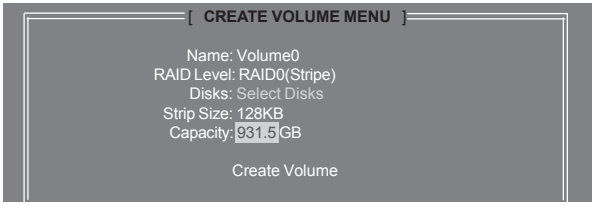




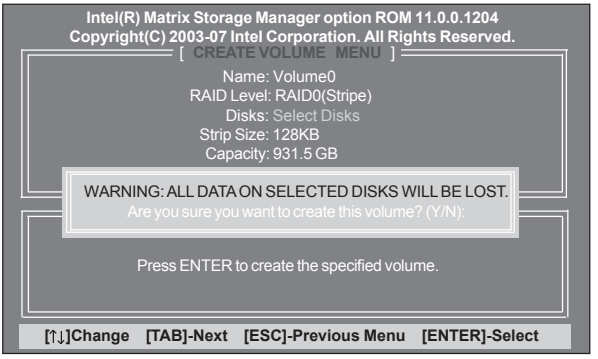
When more than two HDDs are installed in your computer, the *Disks* item will be selectable. Then users can select the HDD that you want to belong to the RAID set. Please be noticed that selecting a wrong disk will result in losing the original data of the HDD.



3. Key in the RAID volume capacity. Use the up/down arrow to choose the *Capacity*. The default value indicates the maximum capacity using the selected disks. Entering a lower capacity allows you to create a second volume on these disks.

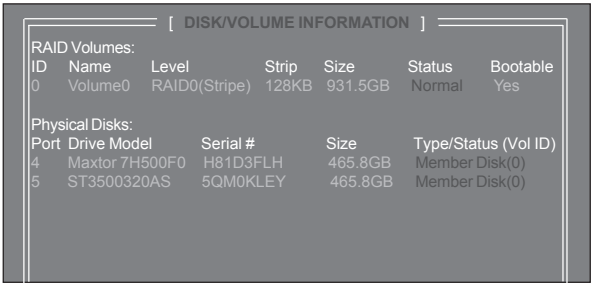


4. When done, press <Enter> to confirm the creation of the RAID set. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

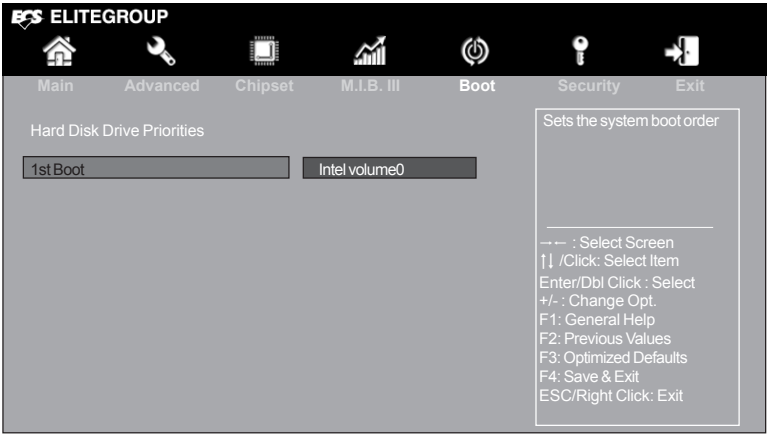

Intel(R) Matrix Storage Manager option ROM 11.0.0.1204
Copyright(C) 2003-07 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 931.5 GB
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):
Press ENTER to create the specified volume.
[↑↓]Change [TAB]-Next [ESC]-Previous Menu [ENTER]-Select

Pressing <Y> deletes all the data in the HDDs.

5. The following screen appears, displaying the relevant information about the RAID set you created.


[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 931.5GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status (Vol ID)
4 Maxtor 7H500F0 H81D3FLH 465.8GB Member Disk(0)
5 ST3500320AS 5QM0KLEY 465.8GB Member Disk(0)

Users please be noted that RAID 0 (Stripe) is set to accelerate the data access, and RAID 1 (Mirror) is set to provide the data backup. If you want to set RAID 0, you need to set the *2nd Boot Device* item in the BIOS to *Intel Volume0*. See section "Advanced Setup" for details.



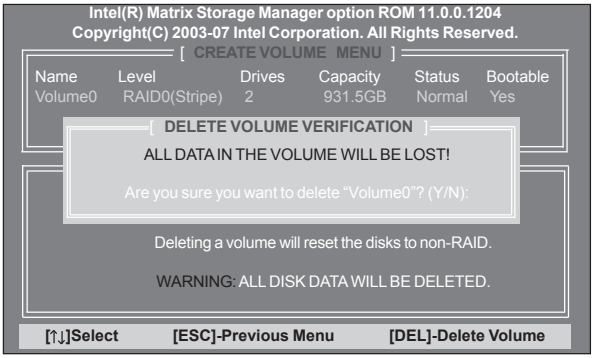
Deleting a RAID set

1. In the main Intel® Rapid Storage Technology RAID BIOS menu, highlight *Delete RAID Volume* using the up/down arrow key then press <Enter>.

2. Use the space bar to select the RAID set you want to delete.

   Press the <Del> key to delete the set.

3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.


Intel(R) Matrix Storage Manager option ROM 11.0.0.1204
Copyright(C) 2003-07 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 931.5GB Normal Yes
[DELETE VOLUME VERIFICATION]
ALL DATA IN THE VOLUME WILL BE LOST!
Are you sure you want to delete "Volume0"? (Y/N):
Deleting a volume will reset the disks to non-RAID.
WARNING: ALL DISK DATA WILL BE DELETED.
[↑↓]Select
[ESC]-Previous Menu
[DEL]-Delete Volume

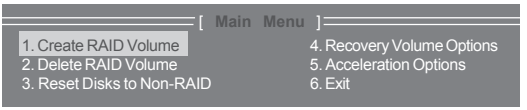
Pressing <Y> deletes all the data in the HDDs.

Resetting disks to Non-RAID

An HDD that has been previously configured as part of another RAID set in another platform is called a broken RAID HDD. When you install a broken RAID HDD, you cannot select this disk when configuring a RAID set through the Intel® Rapid Storage Technology option. If you still want to use this broken RAID HDD as part of the RAID set configured through the Intel® Rapid Storage Technology, you may do so by resetting the disk to Non-RAID. You will, however, lose all data and previous RAID configurations.

To reset disks to Non-RAID:

1. In the main Intel® Rapid Storage Technology RAID BIOS menu, highlight *Reset Disks to Non-RAID* using the up/down arrow key then press <Enter>.



Pressing <Y> deletes all the data in the HDDs.

2. Use the space bar to select the HDD to reset to Non-RAID.
3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

Exiting Setup

When you have finished, highlight *Exit* using the up/down arrow key then press <Enter> to exit the Intel® Rapid Storage Technology RAID BIOS utility.

A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N> to return to the Intel® Rapid Storage Technology RAID BIOS menu.

Chapter 6

AMD CrossFireX™ Technology Support

This motherboard supports the AMD CrossFireX™ Technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

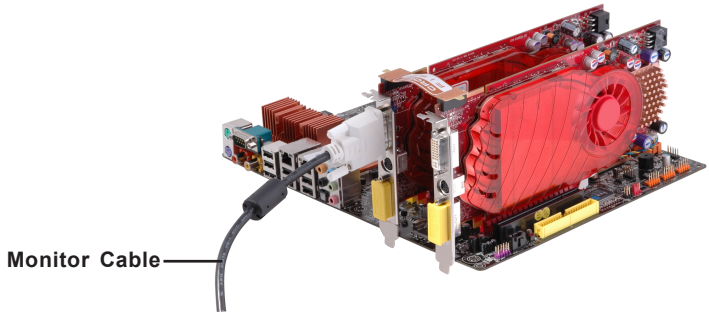
Requirements

1 Two identical CrossFireX™ ready graphic cards are needed for the setup of 2-way CrossFireX™ configuration.
2 You would need one CrossfireX™ bridge cable.
3 Make sure that your graphics card driver supports the AMD CrossFireX™ technology. Download the latest driver from the AMD website (www.amd.com).
4 Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.

Installing CrossFireX™ graphics cards

1. Insert the CrossFireX™ graphics cards into the **PCIEX16/PCIEX16_S1** slots. Make sure that the card is properly seated on the slot.

2. Connect the cable from your monitors to the CrossFireX™ ready graphics card installed on the **PCIE16X** slot.



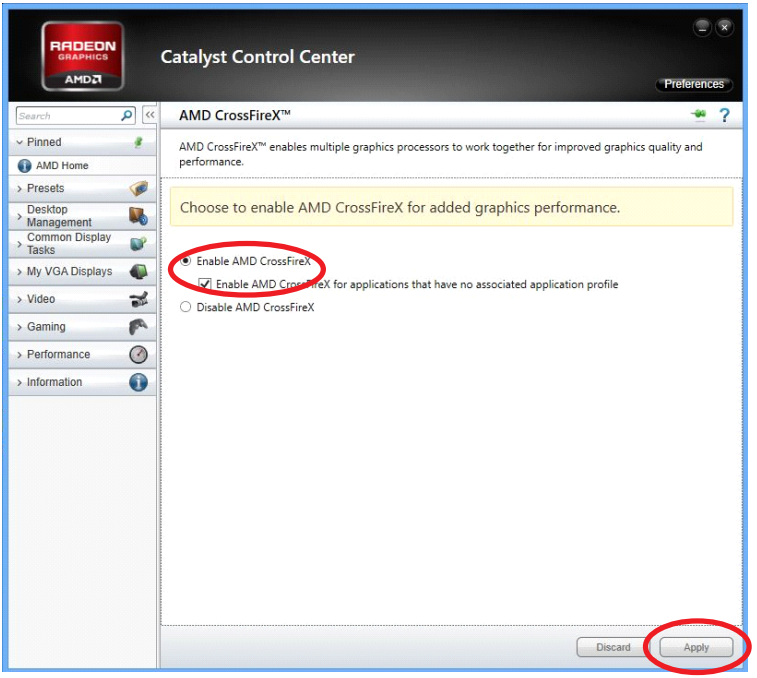
** For reference only*

3. Connect an auxiliary power source from the power supply to the graphics cards.

The Catalyst™ Control Center Dialog Box

To enable CrossFireX™:

- Install AMD graphic card driver.
- Enter the Catalyst Control Center Dialog Box.
- check the "Enable CrossFireX™" item.
- Click Apply button.



Chapter 7
Trouble Shooting

Start up problems during assembly

After assembling the PC for the first time you may experience some start up problems. Before calling for technical support or returning for warranty, this chapter may help to address some of the common questions using some basic troubleshooting tips. You may also log onto our ECS website for more information: *http:// www.ecs.com.tw/ECSWebSite/Support/Support_FAQ.aspx?MenuID=49&childid=M_49&LanID=0*

a) System does not power up and the fans are not running.

1. Disassemble the PC to remove the VGA adaptor card, DDR memory, LAN, USB and other peripherals including keyboard and mouse. Leave only the motherboard, CPU with CPU cooler and power supply connected. Make sure the power cord is plugged into the wall socket & the switch on the Power Supply Unit (PSU) is turned " on " as well. Turn on again to see if the CPU and power supply fans are running.

2. Make sure to remove any unused screws or other metal objects such as screwdrivers from the inside PC case. This is to prevent damage from short circuit.

3. Check the CPU FAN connector is connected to the motherboard.

4. For Intel platforms check the pins on the CPU socket for damage or bent. A bent pin may cause failure to boot and sometimes permanent damage from short circuit.

5. Check the 12V power connector is connected to the motherboard.

6. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

b) Power is on, fans are running but there is no display

1. Make sure the monitor is turned on and the monitor cable is properly connected to the PC.

2. Check the VGA adapter card (if applicable) is inserted properly.

3. Listen for beep sounds. If you are using internal PC speaker make sure it is connected.
   a. continuous 3 short beeps: memory not detected
   b. 1 long beep and 8 short beeps: VGA not detected

c) The PC suddenly shuts down while booting up.

1. The CPU may experience overheating so it will shutdown to protect itself. Apply the thermal grease onto the CPU heatsink & ensure the CPU fan is well-connected with the CPU heatsink. Check if the CPU fan is working properly while the system is running.

2. From the BIOS setting, try to disable the Smartfan function to let the fan run at default speed. Doing a Load Optimised Default will also disable the Smartfan.

Start up problems after prolong use

After a prolong period of use your PC may experience start up problems again. This may be caused by breakdown of devices connected to the motherboard such as HDD, CPU fan, etc. The following tips may help to revive the PC or identify the cause of failure.

1. Clear the CMOS values using the CLR_CMOS jumper. Refer to CLR_CMOS jumper in Chapter 2 for Checking Jumper Settings in this user manual. When completed, follow up with a Load Optimised Default in the BIOS setup.

2. Check the CPU cooler fan for dust. Long term accumulation of dust will reduce its effectiveness to cool the processor. Clean the cooler or replace a new one if necessary.

3. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

4. Remove the hard drive, optical drive or DDR memory to determine which of these components may be at fault.

5. Check whether there is any bulked up electrolytic capacitor or abnormal component.

Please logo onto our ECS website: http://www.ecs.com.tw/ECSWebSite/Support/Technical_Support_List.aspx?MenuID=50&LanID=0 for more information.

Maintenance and care tips

Your computer, like any electrical appliance, requires proper care and maintenance. Here are some basic PC care tips to help prolong the life of the motherboard and keep it running as best as it can.

1. Keep your computer in a well ventilated area. Leave some space between the PC and the wall for sufficient airflow.

2. Keep your computer in a cool dry place. Avoid dusty areas, direct sunlight and areas of high moisture content.

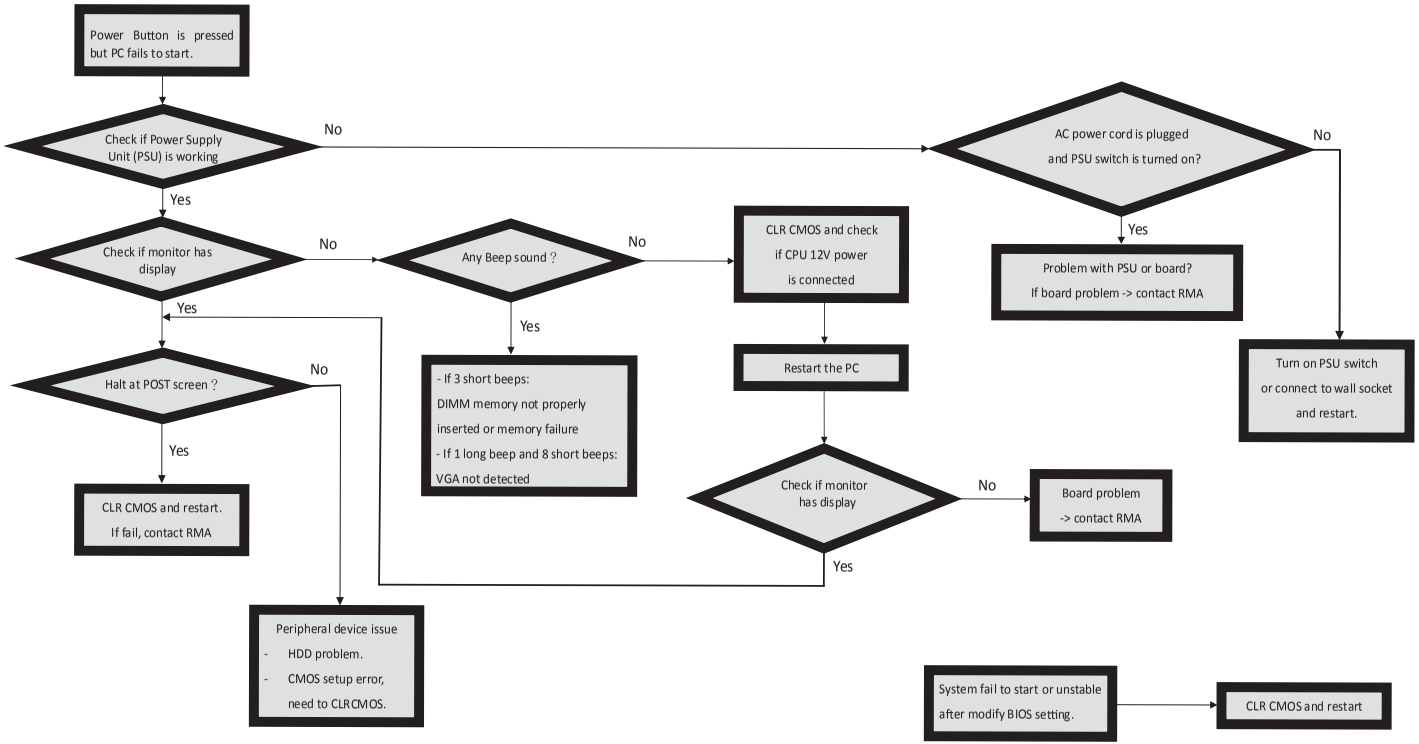
3. Routinely clean the CPU cooler fan to remove dust and hair.

4. In places of hot and humid weather you should turn on your computer once every other week to circulate the air and prevent damage from humidity.

5. Add more memory to your computer if possible. This not only speeds up the system but also reduces the loading of your hard drive to prolong its life span.

6. If possible, ensure the power cord has an earth ground pin directly from the wall outlet. This will reduce voltage fluctuation that may damage sensitive devices.

Basic Troubleshooting Flowchart


Power Button is pressed but PC fails to start.
Check if Power Supply Unit (PSU) is working
No
Yes
AC power cord is plugged and PSU switch is turned on?
No
Yes
Problem with PSU or board? If board problem -> contact RMA
Turn on PSU switch or connect to wall socket and restart.
Check if monitor has display
No
Yes
Any Beep sound ?
No
Yes
CLR CMOS and check if CPU 12V power is connected
Restart the PC
- If 3 short beeps: DIMM memory not properly inserted or memory failure
- If 1 long beep and 8 short beeps: VGA not detected
Halt at POST screen ?
No
Yes
CLR CMOS and restart. If fail, contact RMA
Check if monitor has display
No
Yes
Board problem -> contact RMA
Peripheral device issue
- HDD problem.
- CMOS setup error, need to CLRCMOS.
System fail to start or unstable after modify BIOS setting.
CLR CMOS and restart

Memo